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# EXHIBIT 2

No. 143-2015

The Embassy of the United States of America to the Holy See presents its compliments to the Secretariat of State and has the honor to inform the Secretariat that the United States Attorney's Office (USAO) and the Federal Bureau of Investigation (FBI) are currently investigating the financial reporting of Autonomy, a public company. As part of the investigation, the USAO and FBI are requesting information concerning a potential transaction in 2010 connected to the Vatican Apostolic Library.

The Embassy respectfully asks if Monsignor Cesare Pasini, Prefect of the Vatican Apostolic Library, would be willing to speak to investigators from the USAO and FBI about this investigation. The investigators are seeking information from Monsignor Pasini to aid their investigation of Autonomy. Neither Monsignor Pasini, nor the Holy See or Vatican City State is a target of this investigation.

**DIPLOMATIC NOTE**

The Embassy has the honor to attach to this request a list of the questions that the investigators hope to ask Monsignor Pasini in person and another document with background on the case.

The Embassy of the United States of America to the Holy See takes this opportunity to renew to the Secretariat of State the assurances of its highest consideration.

Embassy of the United States of America to the Holy See,

Rome, ITALY

August 10, 2015



The United States Attorneys Office (USAO) and Federal Bureau of Investigation (FBI) are investigating the financial reporting of Autonomy, a public company that was acquired by Hewlett-Packard in 2011. In March 2010, Autonomy recognized revenue on a transaction with a U.S. company called MicroTech. Under the purchase order, MicroTech bought Autonomy software for resale to the Vatican. The USAO is investigating whether it was appropriate for Autonomy to recognize revenue on the transaction.

We believe that no sale was ever consummated between Autonomy and the Vatican, or between MicroTech and the Vatican. We wish to inquire about the negotiations from 2009 to 2011 to understand how close, if at all, Autonomy and the Vatican were to an agreement and the proposed terms.

We would like to underscore that the purpose of this interview would be to investigate Autonomy. Neither Monsignor Pasini, nor the Holy See or Vatican City State is the target of this investigation. We would simply be grateful for Monsignor's cooperation in investigating the potentially fraudulent activity of this U.S. company that had a significant effect on U.S. investors.

Specifically, we wish to ask Monsignor Pasini the following questions in person:

Please describe your discussions with Autonomy in 2009, 2010, 2011.

What software were you contemplating purchasing and why?

Please describe the negotiations. With respect to meetings, conference calls, or other interactions, please describe: the location, the participants, and the terms discussed.

Did Autonomy provide you any written proposals?

How were those received?

Was there any discussion of resellers, such as MicroTech?

Please describe your communications with the following people:

Mike Lynch

Sushovan Hussain

Andy Kanter

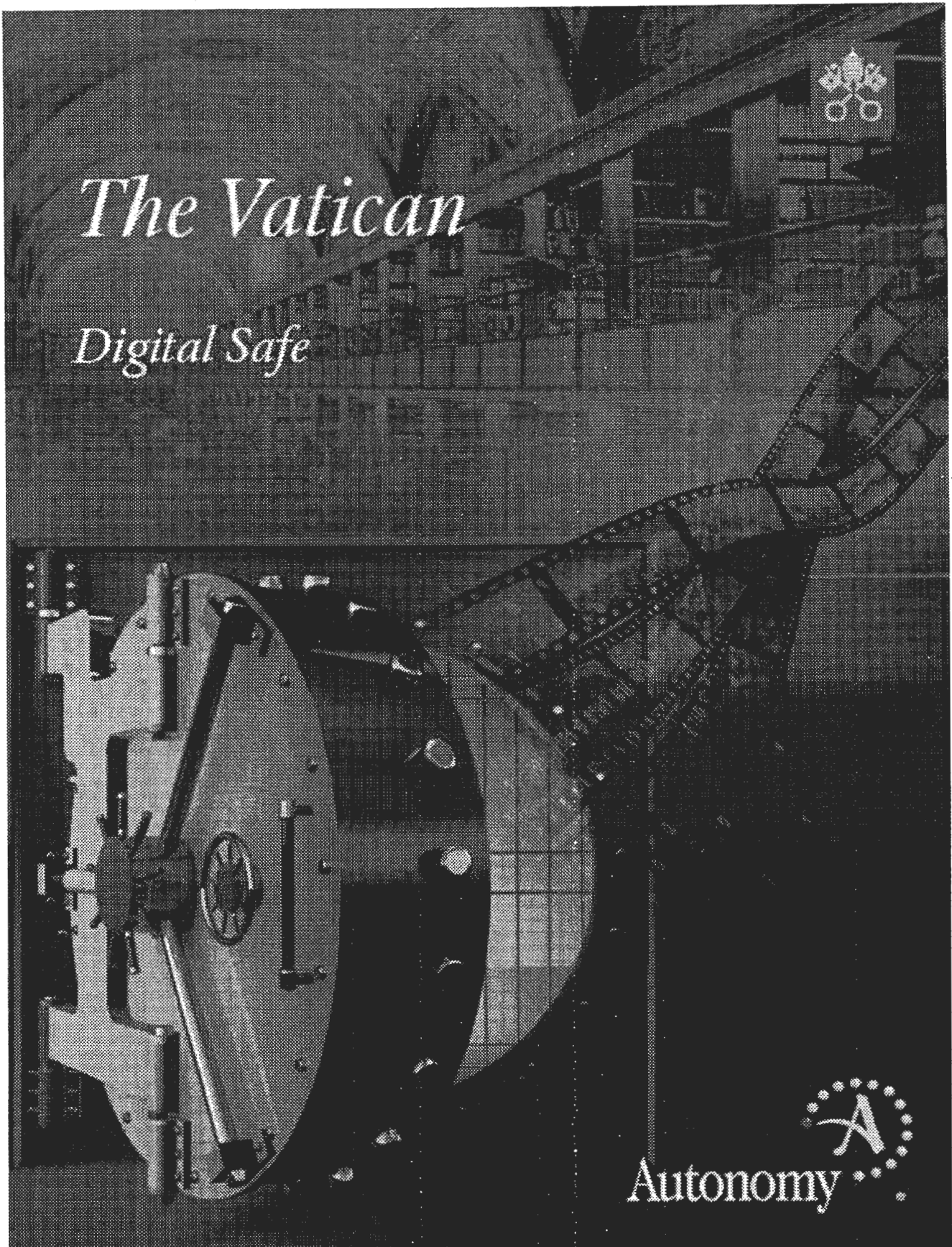
Corrado Broli

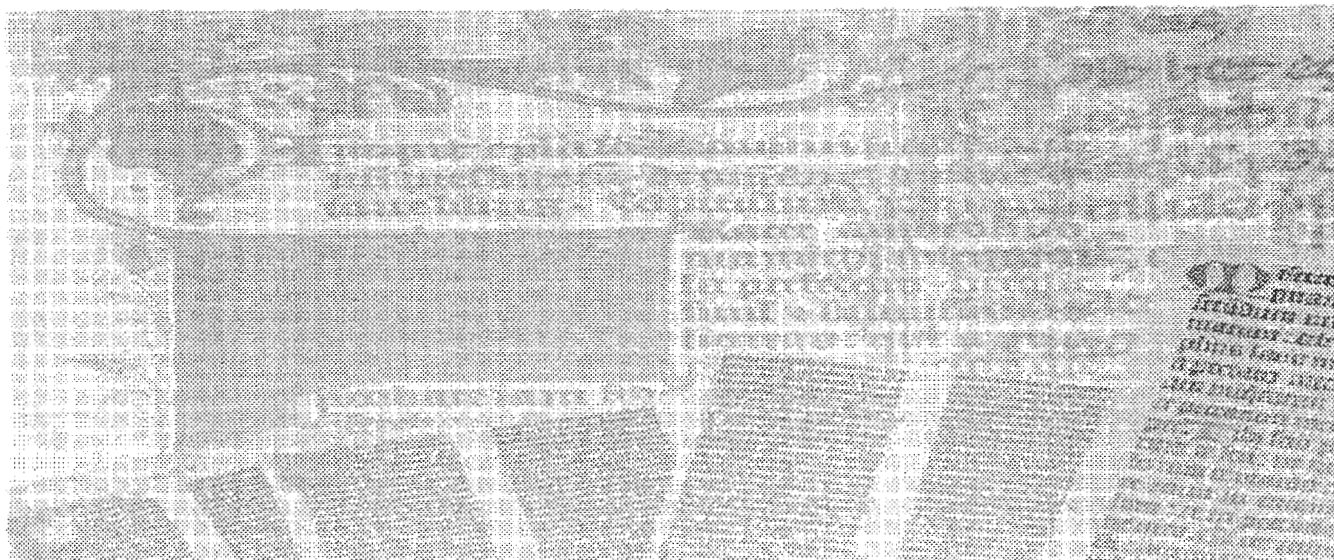
Pete Menell

During the negotiations, was there any discussion of Autonomy, or any officer or director including Mike Lynch, making a contribution to the Vatican or affiliated entity? Was there discussion of creation of a foundation? What did that involve?

Please describe all communications relating to MicroTech.

We also have a number of documents (attached) that we wish to discuss. We request that you maintain the confidentiality of the documents.





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## **Biblioteca Apostolica Vaticana Requirement**

The contents of the Biblioteca Apostolica Vaticana are manuscripts and scrolls of historical importance and this wealth must be protected. Thus the Biblioteca Apostolica Vaticana requires an end to end solution for the capture of the libraries ancient manuscripts to a digital and imperishable image format for subsequent storage to a long term archive. Additionally the Biblioteca Apostolica Vaticana is interested in features that will give the library the opportunity to further explore the richness of the content within the archives.

## **Solution Summary**

Autonomy proposes an end-to-end solution encompassing software and hardware for the Capture of RAW images from Biblioteca Apostolica Vaticana physical assets. **Conversion** of said RAW images to FITS format. Long term **Storage** of these FITS images using Autonomy Digital Safe technology, which is an Integrated software / hardware layer for maximum reliability and performance, giving customer the options to host themselves or for Autonomy to host in one of our datacenters. **Intelligence**; the Biblioteca Apostolica Vaticana is interested in offering users of the system the possibility to compare a given written letter or symbol or phrase extracted from a document under analysis with the whole archived document corpus. This functionality could allow scholars of ancient manuscripts the possibility to associate a particular work to a specific author and from there start the paleographic study of the content. Autonomy enables this and many more intelligent functions including; intelligent OCR, advanced search, hyperlinking, conceptual clustering... and many more, thus giving the Biblioteca Apostolica Vaticana unparalleled access to this wealth of information.

## **Why FITS**

Digital Image formats are subject to trends, technological advances and changes in usage patterns which lead to potential problems in viewing images created in contemporary formats in future. The Biblioteca Apostolica Vaticana has established the requirement for use of a file format that is immune to data deterioration and technology changes.

Flexible Image Transport System (FITS) was originally developed in the late 1970's as an archive and interchange format for astronomical data files and used by NASA. FITS is much more than just an image format (such as JPG or GIF) and is primarily designed to store scientific data sets consisting of multidimensional arrays and 2-dimensional tables containing rows and columns of data. This format has been designated as the format of choice for Biblioteca Apostolica Vaticana.

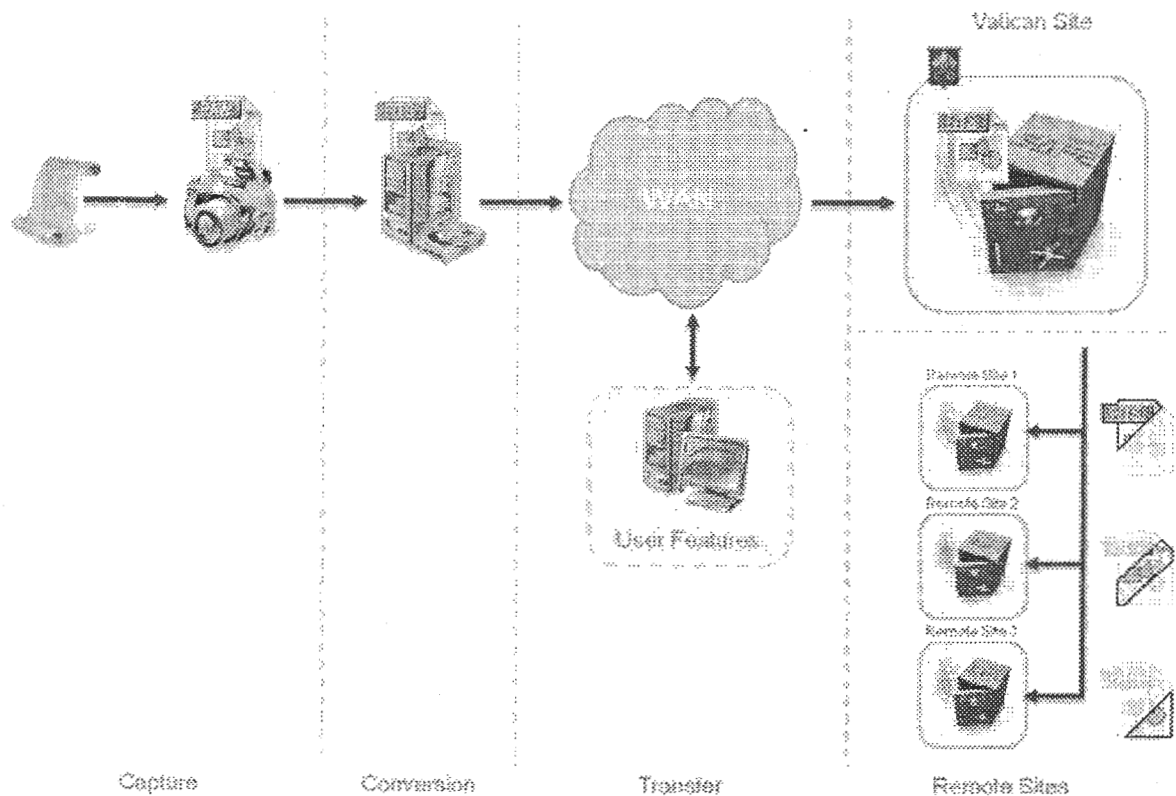
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## Autonomy Solution

In order to present Autonomy's proposition for the Biblioteca Apostolica Vaticana we will describe the proposed workflow and illustrate the benefits within the description of each of the steps within the workflow.

## Solution Workflow



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## Capture

Each manuscript is photographed with a digital camera, specifications of which can be determined at a later date, and a RAW file of the image is generated. A capture/acquisition workstation is then used to manage the digital images collected from the digital camera as a staging area. This staging area can be used to perform any manipulation/tuning of the images before moving on to the next stage in the process.

Once the RAW file has been accepted as correct we can proceed to the conversion of the RAW file into FITS format.

## Conversion ~ Autonomy FITS plug-in

The Biblioteca Apostolica Vaticana requires that the dependency on Adobe Photoshop and an associated third party plug-in for conversion from RAW format to FITS be removed from the workflow.

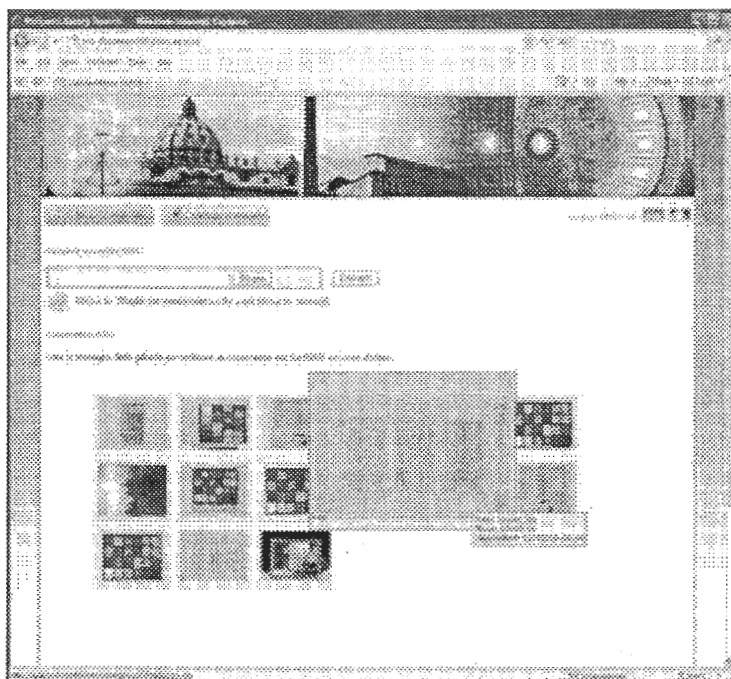
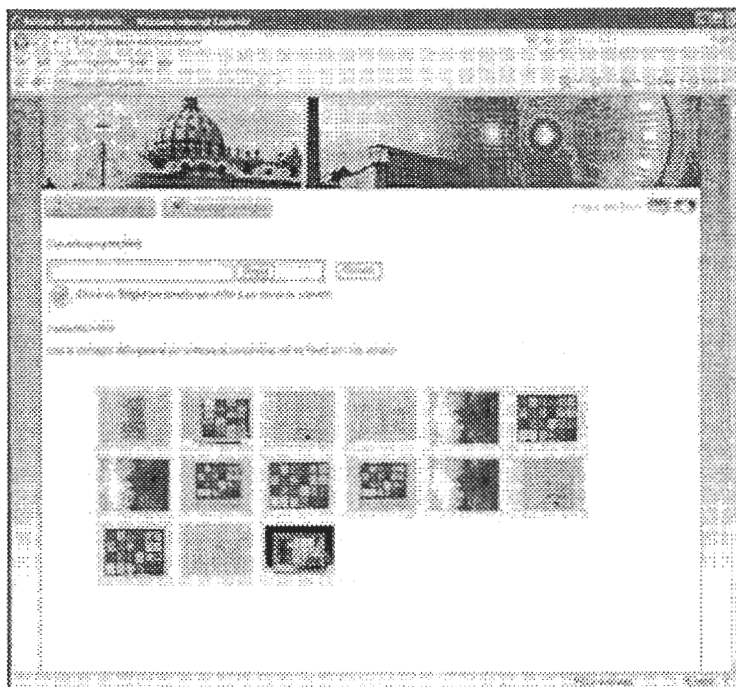
Autonomy has developed and maintains/updates the necessary software for RAW to FITS conversion called *Autonomy FITS plug-in* which does not use third-party technology but is entirely owned by Autonomy and which is available on Microsoft's Windows, Linux and Unix platforms. Autonomy also proposes the use of a FITS viewer which removes the requirement to even use Photoshop for viewing.

The morphology of a FITS file is made up of one or more *Header + Data Units* (HDUs). In simple terms the Header, which is in ASCII format, describes the layout of the image that follows within the Data Unit. Thus the format is self discovering and the user will always be able to read the header and hence know how to interpret the contained image.

RAW files are then converted into FITS using the Autonomy FITS plug-in and following FITS paradigms.

The images on the following page give us a view of the interface associated to this processes, allowing for the user to choose images and convert to FITS format before committing to the archive and including "thumbnail zoom" functionality for easy reference.

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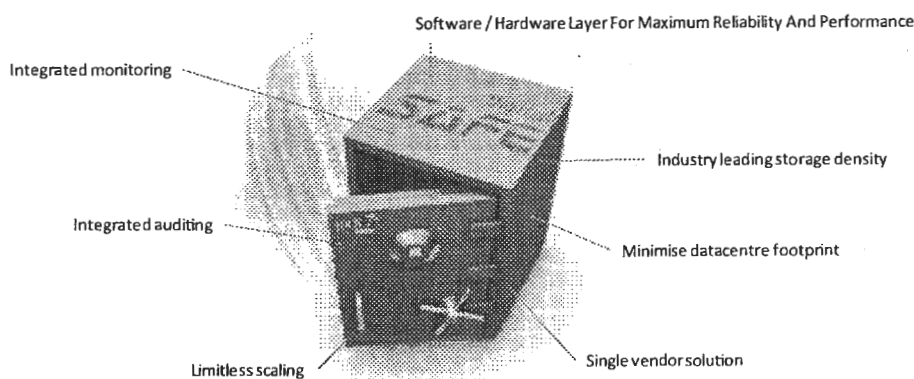


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## Transfer & User Features

The transfer of the FITS assets from the Conversion stations to the storage sites will occur across a WAN. Transfer mechanisms are proprietary technology of Autonomy and assure the transactional integrity of all items through transfer as well as maximum compression for efficient use of the available bandwidth.

## Storage - Autonomy DigitalSafe



FITS images can then be stored into the Autonomy DigitalSafe.

The requirements presented for this installation include a DigitalSafe infrastructure for the principal Vatican site which will hold the totality of the data and 3 further DigitalSafe environments which will be separate and each include a third of the assets which can then be used to reconstitute the totality of the assets via user request.

Autonomy Digital Safe is a massively scalable, polyvalent, hosted or on-site archive Software and Hardware solution that enables customers to outsource the storage and management of any form of electronic information.

It currently stores more than 60 billion assets and adding more than one billion new assets every 45 days. Digital Safe's scalability is unique and unmatched.

At the centre of the capability for arbitrary data archiving within DigitalSafe is ZFH (Zantaz File Handle); in effect this is a DigitalSafe virtual file system allowing for segmented data sector distribution, archiving and operational access of large files.

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All items stored within the Digital Safe are automatically associated with a Zantaz Digital Key (ZDK) which is a targeted locator of an asset within the Digital Safe cloud. As information encapsulated within a SOAP message arrives at the DigitalSafe Web Service Portal (WSP) files within are considered within the templates of DigitalSafe data types and if certain characteristics are encountered such as size above a certain threshold to determine the storage mechanism.

Files are broken down into a number of sectors (N) and archived in N cells within a group. As these cells report back the ZDK identifier for the information presented to the WSP a global ZDK which represents all the information related to the cohesion of the file and its distributed components is archived as an entry in another cell (N+1).

Intelligent distribution algorithms allow for the appropriate spread and distribution of the different sectors to the forest of cells for each customer. At retrieval time, the resulting number of simultaneous parallel sector retrievals through the network take full advantage of available bandwidth.



DigitalSafe extends archiving features to support all features of IDOL through the use of IDOL within the standard DigitalSafe cells and gives customers the flexibility to attain required SLA' through the use of Extended IDOL Cells (ExIC)

DigitalSafe split cell infrastructure have an unlimited horizontal scaling capability, with each cell pair representing a fully redundant unit with storage, index and processing capabilities. The latter capability is used most extensively for higher functions.

A DigitalSafe Cell unit will attain a determined SLA in the standard cell architecture with regards to processing and servicing higher level IDOL functions. Using the inherently scalable and massively distributed IDOL infrastructure the ExIC, a polyvalent specialized cell architecture designed to maximize the processing and mapping capabilities for IDOL, customers to achieve even the most stringent SLA's through horizontal and vertical scaling of IDOL.

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## Intelligence – Autonomy IDOL

At the heart of Autonomy's Digital Safe lies the Intelligent Data Operating Layer (IDOL) Server. The IDOL Server collects indexed data from the processed images, optimized for fast processing and retrieval of data. As the information processing layer, IDOL forms a conceptual and contextual understanding of all content in the archive, automatically analyzing any piece of information. Over 500 operations can be performed on digital content by IDOL, including hyperlinking, agents, summarization, taxonomy generation, clustering, education, profiling, alerting and retrieval.

### Interface

In order to put the features and intelligence of the solution in context we will use images from a real system used to demonstrate to the Biblioteca Apostolica Vaticana

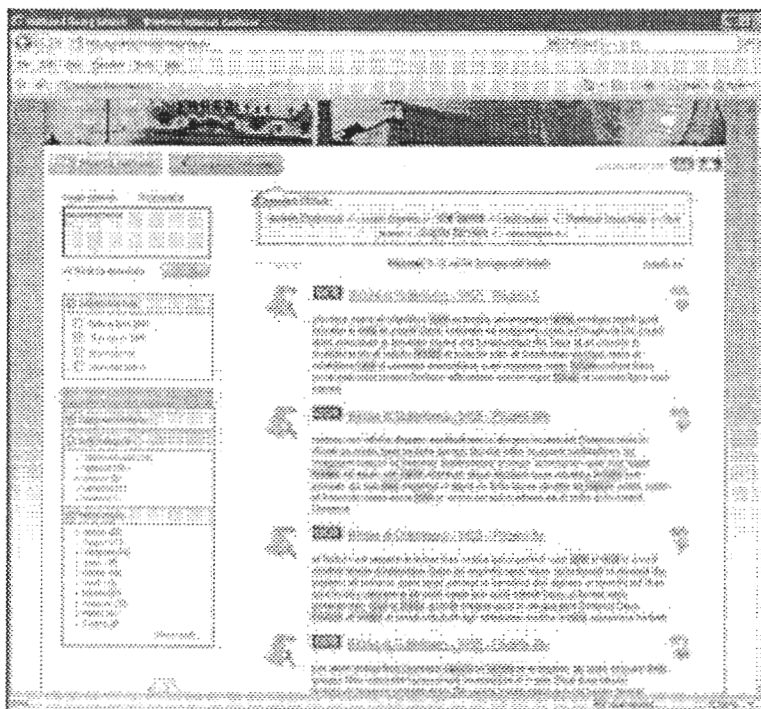


The user is initially presented with the view we can find in the image above. This interface allows the user to perform search functions using natural language for example a sentence, paragraph or page of text, or the derived contextual information of an audio or speech snippet and returns references to conceptually related documents ranked by relevance or contextual distance.

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IDOL also allows the user to perform Boolean searches using a variety of operators, including operators such as AND, OR, NOT, NEAR, DNEAR, SOUNDEX, FUZZY, RANGE, etc.

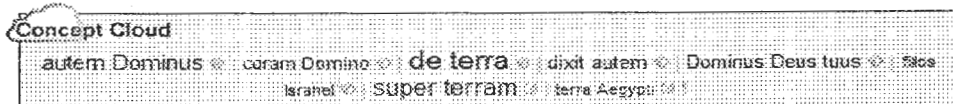
The user can also restrict the source of information where information is retrieved from (Seleziona le fonti) as well as accessing an advanced retrieval screen for more advanced parameters (Ricerca avanzata).



Once the query is executed, in this case the query is "caelum et terra", we are presented with a number of key features;

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## Idea Cloud



Following a query, IDOL displays all the prominent concepts extracted from each document in the result set. These "ideas" are derived from analyzing the entire text of each document and not dependent on subjective metatags. The larger and bolder "ideas" indicate the appearance of that concept in many documents in the results list. The user can use the ideas cloud to focus his/her search even further. Clicking on an idea will refresh the results list with a more specific context that contains that concept.

## Document Results

Each result is presented with a title which allows the user to access the actual image of the document together with the OCR content that Autonomy has processed, a percentage relevance calculation to give the user a guide as to it's match to the initial criteria and an automatic summary of the document which can be generated in three different ways;

- The conceptual summary displays a few sentences from the document that contain the most salient concepts (these sentences can be from different parts of the result document)
- The contextual summary relates to the context of the original query—allowing the most applicable, dynamic summary to be provided in the results of a given query
- The simple summary comprises a few sentences of the result documents

Finally this summary is highlighted with the terms found in the query.

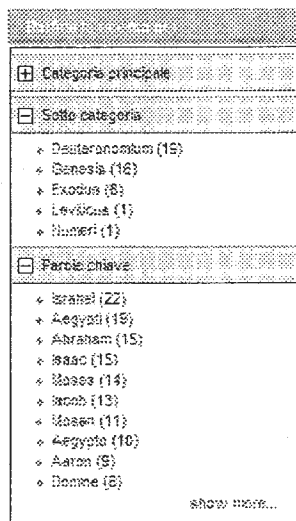


**ocr:** Bibbia di Gutenberg - 1455 - Pagina 5

84%

piscibus maris et volatilibus caeli et bestiis universaeque terrae omnique reptili quod movetur in terra et creavit Deus hominem ad imaginem suam ad imaginem Dei creavit illum masculinum et feminam creavit eos benedixitque illis Deus et ait crescite et multiplicamini et replete terram et subicite eam et dominamini piscibus maris et volatilibus caeli et universis animantibus quae moventur super terram dixitque Deus ecce dedi vobis omnem herbam adferentem semen super terram et universa ligna quae habent

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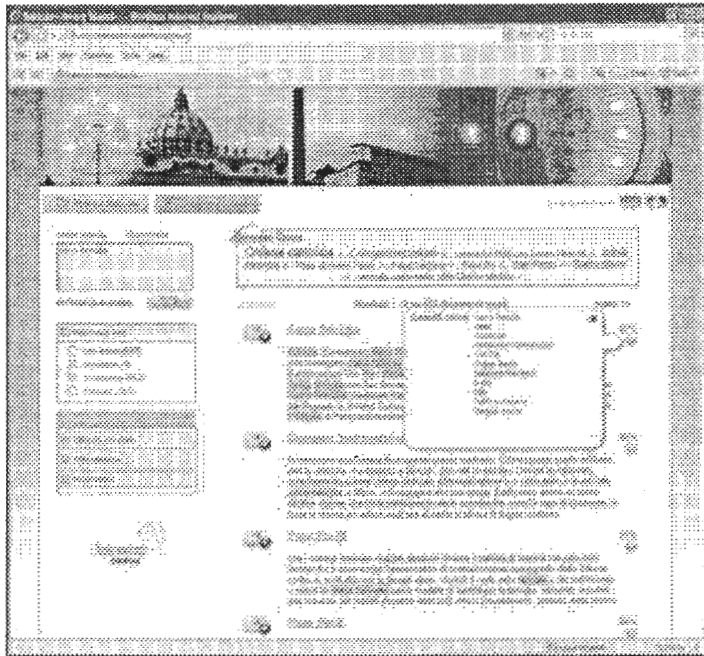
**Parametric tree**

As part of the intelligence in guiding the user through large volumes of information IDOL delivers a query input screen that can dynamically present navigable parameters based on document properties and all metadata attributes -- explicitly defined, automatically generated and even fields that were not previously used.

IDOL's Parametric Navigation offers a way to integrate valuable information from structured attributes with unstructured content. This allows IDOL to deliver better results based on user's intent. All attributes on a per document basis and based on a positive return for the query executed are counted and presented to the user for evaluation.

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## Document Concept Identification

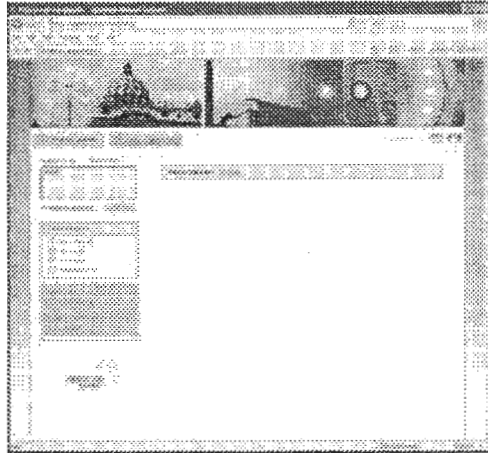


Autonomy's concept based technology also allows the user to identify the key ideas contained in each document via a simply screen icon.

Concetti Chiave: Sacra Famiglia  
 Gesù  
 Giuseppe  
 Rembrandt Harmenszoon  
 Van Rijn  
 Chiesa Madre  
 Giuseppe Raparoli  
 Maria  
 San  
 dottrina cristiana  
 famiglia umana

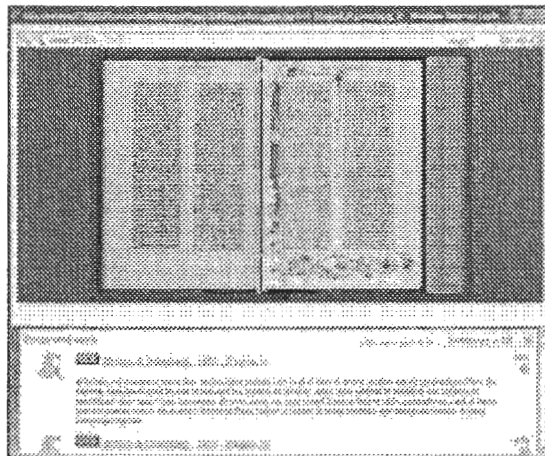
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### Spelling Correction



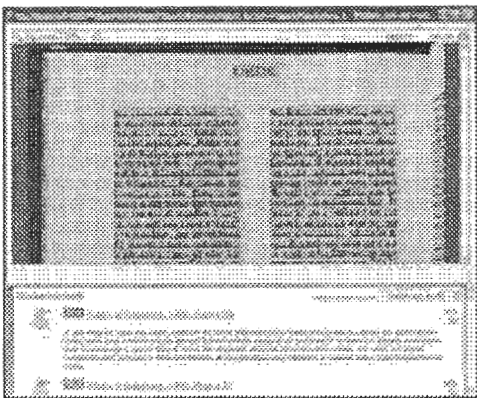
Autonomy present the user with a powerful spelling correction algorithm that can automatically help the user identify correct spellings of terms as well as phrases.

### Hyperlinking



IDOL allows manual and fully automatic linking between related pieces of information regardless of their format. The concepts in a document can be linked automatically to those in another file. In this case, when we open a document from the main search we open our top result and we see the constructed *Book* view, which represents the book or manuscript as the user would see it physically if they were reading, the user can see at the bottom of the screen results linked conceptually from the rest of the document library.

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**OCR Analysis**

Autonomy's image processing libraries use complex statistical techniques to provide a huge range of functionality. In one instance these techniques can be applied to images of text to allow a number of operations in the field of Optical Character Recognition (OCR). The most usual operation is the automatic conversion of an image to its textual form, and Autonomy's OCR technology provides an extremely versatile platform for such usage. A wide-range of character fonts are supported as standard, including medieval fonts, and the

module is also able to detect which font a piece of text is written in. In addition, it is very easy to add new fonts, with just a few examples of each character required to train a new scheme. The OCR process is augmented by dictionaries that can be user-defined, and Latin is provided as standard. Hand-written script is also supported.

However, as is the case with any OCR system, there will always be characters or text that the system is unable to detect correctly, particularly when the image is faded or unclear, or the text is in an inconsistent hand-written script. In such situations the module can be used to augment any manual operations, and act as an intelligent tool to speed the process. For example, all classification is given a probabilistic measure of its confidence, and so can be set to only give OCR results for characters that it is confident are correct. In addition it can be used to provide the top few guesses of a character or word to assist any manual process.

The image processing libraries also support full-page layout detection, automatically identifying a number of aspects including images, columns, or changes in font or character size within the text.

The same image technology can be used to automatically determine similarity between aspects of images. For example, having identified images within a page, they can be matched to the existing database of images to find any that are similar in any one of a number of ways. This can be extended to handwriting, identifying key letters that are most indicative of a particular writer's script to find manuscripts created by the same hand.

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## Introduction to Autonomy

Founded in 1996 and built on ground-breaking research carried out at Cambridge University, Autonomy (LSE: AU. or AU.L) has experienced a meteoric rise to become the undisputed leader in the field of meaning based computing, that is the handling and processing of unstructured information such as emails, documents, phone calls and video. It encompasses areas such as enterprise search, taxonomies, compliance, CRM and CEM amongst others.



At the core of Autonomy's offering is the Intelligent Data Operating Layer (IDOL), a platform which sits at the center of an enterprise's data and forms a conceptual and contextual understanding of that information. This complete infrastructure layer automatically analyzes any piece of information, be it text, voice or video and, through Autonomy's extensive range of functionality, performs advanced operations (such as hyperlinking, clustering, profiling, retrieving, categorizing) on that information in real-time. Using complex mathematical algorithms and advanced pattern-matching techniques, Autonomy's IDOL empowers organizations to realize and respond to the real business value of all the information held within the enterprise.

Autonomy was founded out of a vision to dramatically change the way in which we interact with information and computers. As information technology has advanced, individuals and organizations face an increasing deluge of information, much of it unstructured in nature. Gartner Group, for example, estimates that 7 million web pages are added to the internet every day and that the volume of unstructured, human friendly information such as emails, word documents, PDFs or web pages, is doubling in the enterprise every three months.



R&D is the largest department in Autonomy, with world renowned highly qualified specialists, many of whom have conducted research at the world's top universities. Autonomy holds more than 130 patents for its ground-breaking work. Autonomy is widely recognized by analysts including Gartner Group and Forrester Research as the market leader and has been acknowledged by Delphi as the fastest growing of the publicly traded companies in the space.

In a world of information overload, Autonomy's mission is to help organizations understand what matters, by automatically uncovering and releasing valuable information from the surrounding noise. Autonomy's technology automates the management, processing and

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delivery of information, both structured and unstructured, from disparate internal and external sources, applying that information to real business objectives such as knowledge management, business intelligence, e-learning, customer relationship management, enterprise portals, enterprise resource planning, online publishing and security applications.

In March 2009, Autonomy acquired Interwoven, Inc., a global leader in content management software. The newly combined organization positions Autonomy as one of the strongest companies in enterprise software, with more than 20,000 customers and 2,000 employees and a \$3B market capitalization. We have a clear leadership position in several fast-growing markets, and a vision to fundamentally change the way organizations discover, analyze, and manage information.

Autonomy's technology is horizontal, fully scalable and language independent, thereby making it the sensible choice for customers in all vertical markets. Over 20,000 enterprises, government and intelligence agencies and software developers worldwide have IDOL at the center of their organizations, automating critical processes around information.

Autonomy's customer base comprises more than 20,000 global companies and organizations including: 3, ABN AMRO, AOL, BAE Systems, BBC, Bloomberg, Boeing, Citigroup, Coca Cola, Daimler Chrysler, Deutsche Bank, Ericsson, Ford, GlaxoSmithKline, Kraft Foods, Lloyd TSB, NASA, Nestle, the New York Stock Exchange, Reuters, Shell, T-Mobile, the U.S. Department of Energy, the U.S. Department of Homeland Security and the U.S. Securities and Exchange Commission. Autonomy also has over 350 OEM partners and more than 400 VARs and Integrators, numbering among them leading companies such as BEA, Business Objects, Citrix, EDS, IBM Global Services, Novell, Sybase, Symantec, TIBCO and Vignette. The company has offices worldwide.



Cambridge : San Francisco : Boston : New York : Washington DC : Sunnyvale : Amsterdam :  
Buenos Aires : Beijing : Tokyo : Brussels : Frankfurt : London : Madrid : Milan : Munich : Oslo :  
Paris : Rome : Shanghai : Singapore : Stockholm : Sydney : Kuala Lumpur : Mexico City : Buenos  
Aires

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VATICAN APOSTOLIC LIBRARY, April 7, 2010

## 1 PROJECT DESCRIPTION

- One of the main targets of our institution is to make it easier for our scholars, long course academicians, students about to graduate or occasional visitors, to consult the book heritage.
- In order to achieve this target we have several persons responsible for the consultation rooms, who help, manage and control the work of scholars in the rooms where the access to volumes is allowed by means of open bookcases and other personnel who is responsible for the careful distribution of manuscripts and printed books which are located in our warehouses.
- In these last years the trend in the academic circles is to use technology to improve services and quality of the research thus assuring also future generations the availability of the book heritage which, up to now, we have enormously enjoyed.
- The task of the librarian has greatly developed over the years and he has turned from a simple jealous keeper of heritage into a careful spreader of heritage.
- As the years have gone by, technology has certainly had an important role of support to this activity and each day it is possible to notice technological efforts aimed at getting more satisfactory results.
- Unfortunately however in-depth studies highlight the fragility of the rarest and most valuable heritage and the damage that manuscripts suffer any time a scholar, even a careful one, takes them in his hands.
- It is necessary to bear in mind, to this regard, that the collection of manuscripts of the Vatican Apostolic Library, even if it is not numerically the most important in the world is however the most valuable; a humanist had already defined it as a splendid collection of very valuable jewels (*praeclara supellectiles*).
- Suffice it to remember some famous samples: one of the main ancient samples of the Greek version of the Bible, the so called *Code B*; the two late-ancient manuscripts (that is to say still produced by the Roman world) with the works by Virgilio illustrated with wonderful miniatures (the *Roman Virgilio* and the *Vatican Virgilio*). From the medieval world there are some samples of monastic collections such as the one of Lorsch, from which the renowned *Evangelario* came, present by Charlemagne to the abbey; or, always from the imperial circles, the sample of *De arte venandi cum avibus* by Frederick II directly commissioned by the author-emperor; the different Petrarca's autographs, among which there is the code of the *Canzoniere* and the one of the drafts; some wonderful illustrated samples of the Dantesque *Comedy*: the most famous is certainly the *Dante* commissioned by Federico da Montefeltro. Also some of the masterpieces of the miniature of the Renaissance come from the Urbinate Library, which has been kept for years in the Vatican: for example the great *Bible*, which in the past cost as much as a cathedral.
- Furthermore, the evidence in the Vatican Library ranges over many languages (Latin, Greek, Hebrew, Samaritan, Aramaic, Syrian, Armenian, Coptic, Ethiopian, Georgian, Arabic, Turkish, Illyrian, Slavonic, Egyptian, Indian, Persian, Chinese, Mexican, Italian, English, French, Spanish, German, Provençal) and different fields of knowledge (literature and history, arts and law, astronomy

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VATICAN APOSTOLIC LIBRARY, April 7, 2010

and mathematics, natural sciences and medicine, liturgy and patristics, philosophy and theology, medicine, music).

- For such purpose and before it is too late, the Vatican Apostolic Library has decided to undertake a project with the aim of allowing also future generations to consult the manuscripts heritage. The project at issue consists of two different aims: the first is the preservation of the manuscripts heritage complying with high-resolution parameters and acquisition devices already fully tested in similar processes.
- The second is the realization of the whole project according to ISO certification standards, most of all laying the foundation so that the FITS format, used within the project, becomes the ISO standard of preservation of future projects regarding digital archiving, completely free of charge.
- The FITS format, as a matter of fact, was planned in the sixties by NASA with the aim of archiving all space missions and all images deriving from them. Its longevity through the sudden transformations and technical progress has also convinced the astrophysics Faculty as well as the nuclear medicine data banks to use it, because its simple structure allows the data to be reread after many years also in operative environments which were not expected to read them.

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VATICAN APOSTOLIC LIBRARY, April 7, 2010

**2 REQUISITES**

ID	Description
REQ-01	The system to realize must allow the digitization of manuscripts of the Vatican Apostolic Library and the maintenance and research of the relative archive.
REQ-02	The manuscripts subject of the digitization and of the consequent archiving are around 80,000.
REQ-03	Each manuscript is composed of about 500 pages.
REQ-04	It is deemed to be of satisfactory quality digitizing each page considering a 8-bit depth x 3 RGB colors considering a 300 ppi depth (pixel per inch) and a resources occupation as regards the RAW image of 100 MB.
REQ-05	For each page it is required to maintain the RAW image as well as the corresponding FITS image.
REQ-06	Each FITS image must have the same quality of the corresponding RAW image; therefore it is considered that each FITS image occupies 100 MB
REQ-07	Each acquired image, before being archived, must be controlled by the Tutor who will confirm its adequate quality level.
REQ-08	The Operator as well as the Tutor must have a professional software at their disposal for images treatment in order to assure an adequate acquisition and control of images.
REQ-09	The (RAW and FITS) images must be archived on a Storage to be installed at the rooms of the Vatican Apostolic Library.
REQ-10	It is required a "Backup" Storage; Backup must be installed in the rooms of the Vatican Apostolic Library.
REQ-11	It is required a site of Disaster Recovery where to store the same information (RAW and FITS images) archived in the Storage.
REQ-12	It is required the maintenance of images (only FITS images) on N Sites, geographically distributed; of each image, stored in the Storage, only a unit (1/N) will be stored on each site; this way it will be possible to obtain a complete image by aggregating all the fragments from N Sites, however none of the sites will contain the complete image.
REQ-13	The system must make it possible to publish on the web low quality draft images of the images of the archived manuscripts.
REQ-14	The system must make it possible to distribute the images of the archived manuscripts to the registered users under different qualities (with the following compression levels: 10%, 30%, 100%).
REQ-15	The system must archive (RAW and FITS) images following an appropriate naming convention bearing the manuscript's CALL NUMBER.
REQ-16	The system must archive (RAW and FITS) images following an appropriate naming convention as regards the directory tree in the file system.
REQ-17	The system must implement proper secrecy policies in order to assure the protection of data stored on N Sites.
REQ-18	The system must implement proper policies of coding of data transferred over the net to the user.
REQ-19	The system must interface with a (Z39.50) system containing descriptive cataloguing data; the outer key to access such data is the CALL NUMBER.

Table 1 – Requisites of the System

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VATICAN APOSTOLIC LIBRARY, April 7, 2010

## 2.1 Dimensioning of the reduced capacity system with 70 operators

It is supposed that the manuscript acquisition will be carried out in two daily shifts each of 5 hours; for each shift 30 people will be employed. We consider 250 working days in a year.

Under the above mentioned assumptions the following dimensioning with regard to Storage, Backup and Disaster Recovery has resulted.

1 <sup>st</sup> TRIENNium, 1 <sup>st</sup> year	
Average time of acquisition 1 page	4 min
Available daily time for the acquisition	5 h * 2 shifts * 30 persons = 270 h = 18000 min
Nr. Pages acquired every day	18.000 min / 4 min = 4.500 pg
Nr. Pages acquired 1 <sup>st</sup> year	4,500 pg * 250 days = 1,125,000 pg
Size of images regarding 1 page	100 MB (img RAW) + 100 MB (img FITS) = 200 MB
Storage Size 1 <sup>st</sup> year	1,125,000 pg * 200 MB = <b>225 TB</b>
Backup Size 1 <sup>st</sup> year	1,125,000 pg * 200 MB = <b>225 TB</b>
Disaster Recovery Size 1 <sup>st</sup> year	1,125,000 pg * 200 MB = <b>225 TB</b>
Backup DISASTER Size 1 <sup>st</sup> year	1,125,000 pg * 200 MB = <b>225 TB</b>
Server Autonomy 10-30-100 150%	1,125,000 pg * 200 MB = <b>225 TB</b>
Backup Autonomy	1,125,000 pg * 200 MB = <b>225 TB</b>
Total STORAGE 1 <sup>st</sup> YEAR	<b>1.350 Peta Byte</b>

For the following years it is estimated that the manuscript acquisition will be carried out in two daily shifts each of 5 hours; for each shift 30 people will be employed. We consider 250 working days in a year.

Under the above mentioned assumptions the following dimensioning with regard to Storage, Backup and Disaster Recovery has resulted.

1 <sup>st</sup> TRIENNium, 2 <sup>nd</sup> and 3 <sup>rd</sup> year	
Average time of acquisition 1 page	2 min
Available daily time for the acquisition	5h * 2 shifts* 30 persons = 300 h = 18,000 min
Nr. Pages acquired every day	18,000 min / 2 min = 9000 pg
Nr. Pages acquired every year	9000 pg * 250 days = 2.250.000 pg
Size of images regarding 1 page	100 MB (img RAW) + 100 MB (img FITS) = 200 MB
Yearly Storage size	2,250,000 pg * 200 MB = <b>450TB</b>
Yearly Backup size	2,250,000 pg * 200 MB = <b>450TB</b>
Yearly Disaster Recovery Size	2,250,000 pg * 200 MB = <b>450TB</b>
Yearly Backup DISASTER Size	2,250,000 pg * 200 MB = <b>450TB</b>
Yearly Server Autonomy 10-30-100 150%	2,250,000 pg * 200 MB = <b>450TB</b>
Yearly Backup Server Autonomy 10-30-100 150%	2,250,000 pg * 200 MB = <b>450TB</b>
Total STORAGE 1 <sup>st</sup> year	2,250,000 pg * 200 MB * 6 = <b>2,700.000 PB</b>
TOTAL STORAGE END 1 <sup>st</sup> TRIENNium	<b>5,625,000 pg * 200 MB = 1.125 * 6 = 6.750 PB</b>
DIGITALIZED MANUSCRIPTS IN 1 <sup>st</sup> TRIENNium	<b>11250</b>
COST X PETA BYTE	<b>6.750 PB * 411,000.00 = € 2,774,250.00</b>

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VATICAN APOSTOLIC LIBRARY, April 7, 2010

## 2.2 Dimensioning of the full capacity system 165 operators

For the following years from the 4<sup>th</sup> to the 10<sup>th</sup> year, that is to say in the second and third phase of the project, it is supposed that the manuscript acquisition will be carried out in two daily shifts each of 5 hours; for each shift 40 people will be employed. We consider 250 working days in a year.

Under the above mentioned assumptions the following dimensioning with regard to Storage, Backup and Disaster Recovery has resulted.

EACH FOLLOWING YEAR, FROM 4 <sup>th</sup> TO 10 <sup>th</sup>	
Average time of acquisition 1 page	2 min
Available daily time for the acquisition	5h * 3 shifts * 40 persons = 600 h = 36,000 min
Nr. Pages acquired every day	36,000 min / 2 min = 18,000 pg
Nr. Pages acquired in an year	18,000 pg * 250 days = 4,500,000 pg
Size of images regarding 1 page	100 MB (img RAW) + 100 MB (img FITS) = 200 MB
Storage size (every year)	4,500,000 pg * 200 MB = 900 TB
Backup size (every year)	4,500,000 pg * 200 MB = 900 TB
Disaster Recovery Size (every year)	4,500,000 pg * 200 MB = 900 TB
Backup DISASTER Size (every year)	4,500,000 pg * 200 MB = 900 TB
Server Autonomy 10-30-100 150% (every year)	4,500,000 pg * 200 MB = 900 TB
Backup Server Autonomy 10-30-100 150% (every year)	4,500,000 pg * 200 MB = 900 TB
Total STORAGE 2 <sup>nd</sup> TRIENNIUM 1 <sup>st</sup> year	4,500,000 pg = 5.400 PB
TOTAL STORAGE END 2 <sup>nd</sup> TRIENNIUM	16.2 PB
DIGITALIZED MANUSCRIPTS END 2 <sup>nd</sup>	32,400
TRIENNIUM COST X PETA BYTE	16.2 PB * € 411,000.00 = € 6,658,200.00

On the whole, for the whole duration of the project the following dimensioning with regard to Storage, Backup and Disaster Recovery has been obtained.

At the end of the project	
Total nr of manuscripts	80,000
Nr. pages per manuscript	500
Total nr. of pages	80,000 manuscripts * 500 pg = 40,000,000 pg
Images size related to 1 page	100 MB (img RAW) + 100 MB (img FITS) = 200 MB
Total storage size	40,000,000 pg * 200 MB = 7.5 PB
Total Backup size	40,000,000 pg * 200 MB = 7.5 PB
Total Disaster Recovery size	40,000,000 pg * 200 MB = 7.5 PB
Total BACKUP Disaster Recovery size	40,000,000 pg * 200 MB = 7.5 PB
Server Autonomy 10-30-100 150%	40,000,000 pg * 200 MB = 7.5 PB
BACKUP Server Autonomy 10-30-100 150%	40,000,000 pg * 200 MB = 7.5 PB
TOTAL STORAGE END OF PROJECT	45.00 PB

Moreover an estimate as regards the band necessary for the transmission of data acquired with regard to the archiving has been carried out; in particular two different strategies of archiving have been considered: the first one is the archiving of acquired images in real time, the second strategy is the archiving of images during the night.

1<sup>st</sup> Strategy – Archiving in real time

1 <sup>st</sup> year	
Payload to transfer	100 MB (img RAW) + 100 MB (img FITS) = 200 MB
Acquisition time (1 <sup>st</sup> year)	4 min
Necessary band for the position (1 <sup>st</sup> year)	6.7 Mbps
Total band necessary for the Storage (1 <sup>st</sup> year)	6.7 Mbps * 30 positions = 200 Mbps

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2<sup>nd</sup> Strategy – Night archiving

1 <sup>st</sup> year	
Payload to transfer	100 MB (img RAW) + 100 MB (img FITS) = 200 MB
Available time per position for the acquisition	2 shifts * 5 h = 10h = 10h * 60 min = 600 min
Average time of acquisition 1 page (1 <sup>st</sup> year)	4 min
Pages per position a day (1 <sup>st</sup> year)	600 min / 4 min = 150 pg
Payload to transfer	150 pg * 200 MB = 30,000 MB
Transfer time of daily data	8 h
Necessary band for the position (1 <sup>st</sup> year)	1.04 Mbps
Total band necessary for the Storage (1 <sup>st</sup> year)	1.04 Mbps * 30 workstations = 31.3 Mbps

1<sup>st</sup> Strategy – Archiving in real time

Following years	
Payload to transfer	100 MB (img RAW) + 100 MB (img FITS) = 200 MB
Time of transfer	2 min
Necessary band for the position	13.3 Mbps
Total band necessary for the Storage	13.3 Mbps * 40 positions = 533.3 Mbps

2<sup>nd</sup> Strategy – Night archiving

Following years	
Payload to transfer	100 MB (img RAW) + 100 MB (img FITS) = 200 MB
Available time per position for the acquisition	3 shifts * 5 h = 15h = 15h * 60 min = 900 min
Average time of acquisition 1 page	2 min
Pages per position a day	900 min / 2 min = 450 pg
Payload to transfer	450 pg * 200 MB = 90,000 MB
Time of transfer of daily data	8 h
Necessary band for the position	3.1 Mbps
Total band necessary for the Storage	3.1 Mbps * 40 positions = 125 Mbps

The same strategies have been considered for the dimensioning of the transmission network necessary for the connection for the Disaster Recovery.

1<sup>st</sup> Strategy – Transmission to the "Disaster Recovery" in real time

1 <sup>st</sup> year 2 <sup>nd</sup> TRIENNium	
Necessary total band (every year)	200 Mbps / 200 MB * 200 MB = 200 Mbps

2<sup>nd</sup> Strategy – Night transmission to the "Disaster Recovery"

1 <sup>st</sup> year 2 <sup>nd</sup> TRIENNium	
Necessary total band (every year)	28.1 Mbps / 200 MB * 200 MB = 28.1 Mbps

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**3 SUMMARY OF COSTS****Summary of costs 1st phase – first triennium**

60 acquisition operators	€ 2.592.000,00	
10 control tutors	€ 612.000,00	
35 Scanner Metis	€ 1.800.000,00	
6 Hasselblad machines	€ 240.000,00	
2 complete CED as per the attached project	€ 4.800.000,00	
4 protection NETONE CED lines firewall	€ 50.000,00	
Switched off fiber between two INTEROOT CED	€ 120.000,00	
ISO Standard FITS format	—	
50 MAC HIGT PRO pc	€ 50.000,00	
Hardware and Software x 2 CED 9.112,500 PB	€ 11.200.000,00	
Inf/band network 40 giga and lan/wan apparatuses	€ 500.000,00	
2 UNIX/LINUX CED BAV system engineers	€ 180.000,00	
Electricity consumption 2x300 KW	€ 54.000,00	
Administrative costs 2 people	€ 122.400,00	

**1st phase – first triennium**

<b>TOTAL COSTS</b>	<b>€ 22.320.400,00</b>	
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VATICAN APOSTOLIC LIBRARY, April 7, 2010

**ANALYSIS OF COSTS** deriving from the last AUTONOMY offer  
dated December 11, 2009

**Summary of costs 2nd phase – second triennium**

120 acquisition operators	€ 5.184.000,00	
45 control tutors	€ 2.754.000,00	
15 Scanner Metis	€ 900.000,00	
Maintenance 45 scanner Metis	€ 195.000,00	
7 Hasselblad machines	€ 280.000,00	
Maintenance of 13 Hasselblad machines	€ 10.000,00	
3 hosting data center services <b>11 PB</b>	€ 5.550.000,00	
4 NETONE protection CED lines firewall	€ 50.000,00	
Switched off fiber between two INTEROOT CED	€ 120.000,00	
ISO Standard FITS format	-----	
27001 ISO Standard digital project	€ 600.000,00	
Hardware and Software x 2 CED <b>22.477,500 PB</b>	€ 29.500.000,00	
Inf/band network 40 giga and lan/wan apparatuses	€ 500.000,00	
4 UNIX/LINUX CED BAV system engineers	€ 360.000,00	
Electricity consumption 2x600 KW	€ 108.000,00	
Administrative costs 2 people	€ 122.400,00	

**2nd phase – second triennium**

<b>TOTAL COSTS</b>	<b>€ 46.233.400,00</b>	
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VATICAN APOSTOLIC LIBRARY, April 7, 2010

**ANALYSIS OF COSTS deriving from the last AUTONOMY offer  
dated December 11, 2009**

**Summary of costs 3rd phase – last quadriennium**

120 acquisition operators	€ 6.912.000,00	
45 control tutors	€ 3.672.000,00	
15 Scanner Metis	€ 900.000,00	
Maintenance 45 scanner Metis	€ 260.000,00	
7 Hasselblad machines	€ 280.000,00	
Maintenance 13 Hasselblad machines	€ 13.300,00	
3 hosting data center services 11 PB	€ 7.405.000,00	
4 NETONE protection CED lines firewall	€ 66.000,00	
Switched off fiber between two INTEROOT CED	€ 160.000,00	
ISO Standard FITS format	—	
27001 ISO Standard digital project	€ 600.000,00	
Hardware and Software x 2 CED 43.500,000 PB	€ 29.500.000,00	
Inf/band network 40 giga and lan/wan apparatuses	€ 500.000,00	
8 UNIX/LINUX CED BAV system engineers	€ 960.000,00	
Electricity consumption 2x600 KW	€ 144.000,00	
Administrative costs 2 people	€ 163.200,00	

**3rd phase – last quadriennium**

<b>TOTAL COSTS</b>	<b>€ 51.535.500,00</b>	
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**Total cost of the project: € 120,089,300.00**

The total cost of the project shall be subject to the increase of costs with regard to human resources which will have an estimated yearly 2% increase.

**From:** Marcello Mustilli <m.mustilli@blmius.com>  
**Date:** Tue, 8 Dec 2009 13:35:53 +0100  
**To:** Julie Dolan<julied@autonomy.com>  
**Cc:** mons. Cesare Pasini<pasini@vatlib.it>; L. ammenti<ammenti@vatlib.it>  
**Subject:** No Meetings Tomorrow - Next meetings

Hello Julie:

contrary to my yesterday's email, I will NOT be available to meet tomorrow. □ I need to attend other meetings during the day in connection with the follow up of the Project.

We are reviewing the revised License you sent. □ We suggest that we meet to discuss it on next Friday 9-12 am or Monday. We will be in touch tomorrow to confirm the date and time for such a meeting.

Have you had time to review the revised MOU, which I sent yesterday. □ Wheter signed or not by Autonomy, the MOU will be presented by the Prefect of the BAV to the Secretary of State TOMORROW MORNING. □ **Therefore we do need that you confirm that you agree on its contents by tonight or in no event later than tomorrow by 11am.**

Best  
Marcello

□

To: 'Chris Goodfellow'[chrisg@autonomy.com]; 'Corrado Broli'[corrado@autonomy.com];  
'Sushovan Hussain'[sushovanh@autonomy.com]  
From: Peter Menell  
Sent: Wed 12/9/2009 6:05:31 PM  
Subject: FW: BAV prototype

fyi

> -----Original Message-----

> From: Peter Menell [mailto:peterm@autonomy.com]

> Sent: 09 December 2009 23:03

> To: 'pasini@vatlib.it'

> Cc: 'piazzoni@vatlib.it'; 'ammenti@vatlib.it'; 'Marco Zanchini'; 'Sean  
Blanchflower'

> Subject: BAV prototype

>

> Dear Monsignor Pasini,

>

> I would like to let you know that we have completed our new manuscript  
analysis

> prototype. In this we have trained our technology on a data set we believe  
to be

> analogous to that held within BAV. This data set is available upon the  
internet

> from the Bodleian Library. Although public it illustrates many of the  
constraints

> and characteristics that we know to be present within the BAV corpus.

>

> Within the prototype we can show you how Autonomy technology uniquely  
learns

> to automatically detect and recognize the hand written signature of any  
given

> author, the pictorial style of an artist, the types of subjects that  
artist depicts and the

> extraction of the terms and letters used.

>

> In addition, to the automatic textual analysis we can show you how the  
Autonomy

> software both removes the signs of aging within a manuscript and corrects  
for any

> distortion a scanner may introduce when attempting to image the text near  
the

> spine of a manuscript.

>

> Further to this we would like to show you how the Autonomy technology can

> automatically read and understand if a document should be referred to a  
human

> reviewer before classification.

>

> Both myself and my head of Research and Development (Dr Sean Blanchflower)

> are in Rome until Friday so we would very much like an opportunity, if  
possible, to

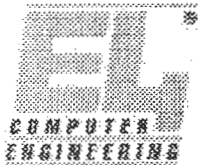
> show you this work.

>

> Kind regards

> Pete Menell

>  
> Dr Peter Menell  
>  
> CTO Autonomy Systems  
>  
> Web: <http://www.autonomy.com>  
> \_\_\_\_\_  
>  
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Scandiano, 11.15 Febbraio 2010

Trasmessa a mezzo posta elettronica a :

ambasciati@vatican.va

Reverendo Monsignor Pasini,

con la presente desideriamo confermarLe che la società E4 S.p.A. giudica positivamente, le modalità operative previste per il progetto "digitalizzazione dei manoscritti", così come, dopo diverse successive versioni, paiono essersi finalmente sedimentate. In particolare prendiamo atto che le modalità da ultime definite prevedono, fra l'altro, la costituzione di una Fondazione di diritto vaticano, espressamente dedicata allo sviluppo di questa straordinaria iniziativa.

Le confermiamo che la nostra società desidera partecipare a questa iniziativa come fornitore tecnologico, procurando e fornendo le tecnologie necessarie all'attuazione del progetto, secondo quanto concordato con la Biblioteca Apostolica Vaticana. A tale scopo E4 S.p.A. conferma la propria disponibilità ad erogare, alla costituenda Fondazione un contributo a fondo perduto di Euro 250.000,00 che, in aggiunta ai contributi forniti da altre Società e/o Istituzioni che già hanno manifestato l'interesse concreto ad un coinvolgimento nel progetto, saranno utilizzati per finanziare il progetto stesso.

Ovviamente l'impegno di E4 S.p.A. è inestricabilmente correlato all'opportunità, che ci è stata prospettata, di partecipare alle forniture di data storage e infrastrutture per un controvalore stimato indicativamente in € 950.000. Le attività, come previsto dalle attuali modalità operative necessarie per la realizzazione del progetto, avranno una durata iniziale di due anni con stati di avanzamento lavori previsti dopo i primi sei mesi.

Durante il primo biennio tutto il supporto tecnico, il software, i servizi di manutenzione ordinaria e le risorse di nostra competenza dedicate allo sviluppo del progetto, saranno erogati gratuitamente alla fondazione; successivamente, al termine del primo biennio, insieme si deciderà la destinazione dei fondi raccolti e le modalità di pagamento per questi servizi nei periodi futuri.

Nel restare pertanto in attesa di concordare gli ulteriori sviluppi e formalizzare gli accordi di collaborazione, Le porgo i più cordiali saluti.

E4 Computer Engineering S.p.A.

Il Presidente.

Vincenzo Nuti

E4 Computer Engineering S.p.A.

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e-mail: info@e4company.com



11 March 2010

Monsignor Cesare Pasini  
Vatican Apostolic Library  
Vatican City

Dear Monsignor Pasini,

Autonomy is pleased to provide the BAV with three contractors trained and qualified to provide scanning services for the BAV Manuscript Testing Project. We will pay the contractors a gross amount of €1500 per month for each contractor for a minimum period of three months based on five hours a day, five days a week. The contractors will work under the supervision of the BAV and the BAV will assume the responsibility for the contractors while working with the manuscripts.

Best Regards,

Acknowledged and Agreed

  
Corrado Broli (AUTONOMY SYSTEMS)

  
Monsignor Pasini (BAV)

Autonomy Systems Limited, Cambridge Business Park, Cowley Road, Cambridge CB4 0WZ, U.K.  
Phone: +44 (0) 1223 448 000, Fax: +44 (0) 1223 448 001, Email: [autonomy@autonomy.com](mailto:autonomy@autonomy.com)

To: 'pasini@vatlib.it'[pasini@vatlib.it]  
Cc: 'ammenti@vatlib.it'[ammenti@vatlib.it]; 'Corrado Broli'[corrado@autonomy.com]  
From: Sushovan Hussain  
Sent: Sun 12/19/2010 5:17:50 PM  
Importance: Normal  
Subject: RE: Commercial proposal on the digitisation of the Vatican library

Dear Monsignor Cesare Pasini,

I would like to say a heartfelt thank you for your gift. It is a marvelous gift and I will treasure it. Also thank you for attending the meeting last Wednesday. The meeting gave me a deeper understanding as to the commercial framework that may facilitate our shared goal. Following on from the meeting, we at Autonomy have given great thought on how we could structure a solution to the goal of digitizing the Vatican library. I have explored some of these ideas with Corrado Broli and he has shared them with Mr. Luciano Ammenti. In this letter I set out my latest thinking and I hope that the Vatican library will be able to socialize the commercial terms with other parts of the Vatican state for financing.

#### Commercial proposal

To make the project viable I believe it is necessary to break it down into a smaller initial phase. We therefore propose that the project is broken down into a one year production pilot which will provide the Vatican with a fully functioning system and infrastructure and a maximum of 3,800 books and manuscripts indexed and archived. There will then be 9 more years left to archive and index the whole of the library.

The cost for this one year production system is proposed at Euro 13.0 million. At a high level this includes:

-

Scanners, cameras, data centre build out, hardware and software

-

Operators and tutors (Vatican Library employees but paid for by Autonomy)

At the end of the year Vatican Library will have 2 fully functioning data centres and 3,800 documents captured and processed. The overall cost over 10 years (including the 1 year production pilot described above) is estimated to be Euro 100.5m (made up of scanners, software, hardware etc of \$77.5m and operators and tutors of Euro 23 million). These costs can be confirmed during the first year build out phase as both of us gain more experience and at this stage can be part of a Memorandum of Understanding for the whole project.

Technical validation

We have been working with the Vatican Library now for nearly two years. During this extended period of time we have completed several technical proofs of concept and pilots. Our team has remained constant throughout this period. We have shared these with the Vatican and very positive feedback has been received. In addition it is Autonomy's core business to build out data centres and host many petabytes of data in highly secure facilities. So we have no problem in guaranteeing the quality and timeliness of our work. Finally Autonomy is a large company with a market value of \$6 billion and we have over \$1 billion of cash on our balance sheet. So financially we are very strong and are able to provide a full end-to-end service for the Vatican Library.

#### Financing proposal

We at Autonomy view this project as a vital gift to history. So we have considered the maximum investment that we can provide to the project at E6.5 million. This should kick start the project and if the Vatican Library is able to finance the remaining E6.5m then the project can commence with immediate effect as we have already negotiated the contract. The thoughts I had as to how the Vatican Library could finance are a combination of own cash, further gifts from the Vatican state and others could be interested in providing secured financing because there will be hardware and data centres at the end of the project with value for collateral.

We would like to start the project as soon as possible and are available to assist in any way including making presentations to qualified others.

Yours sincerely,

Sushovan Hussain

Chief Financial Officer

Autonomy Corp plc

-----Original Message-----

From: L. Ammenti [mailto:[ammenti@vatlib.it](mailto:ammenti@vatlib.it)]

Sent: martedì 21 dicembre 2010 12.32

To: [sushovanh@autonomy.com](mailto:sushovanh@autonomy.com); [corradob@autonomy.com](mailto:corradob@autonomy.com); [pasini@vatlib.it](mailto:pasini@vatlib.it)

Subject: Answer information

dear Sushovan,

i now that you are very busy at the end of year.

I try asked to you some more information about the conversation by phone with me about the correct budget necessary for start the project one year .

Please, if you have one moment free verify with your staff all information give to me a answer.

Best regards

—

\*\*\*\*\*

Biblioteca Apostolica Vaticana

Responsabile Coordinamento dei Servizi Informatici

C.E.D Director Luciano Ammenti

Tel. 39+0669885004 39+0669879449 39+0669879523

Fax. 39+0669884795 39+0669885327

\*\*\*\*\*

From: mons. Cesare Pasini [pasini@vatlib.it]  
 Sent: Thursday, December 23, 2010 11:32 AM  
 To: mrl@autonomy.com  
 Cc: angelab@autonomy.com; sushovanh@autonomy.com; Corrado Broli  
 Subject: Guidelines

Dear Mr. Lynch,

I remember with pleasure meeting with you, your wife and Dr. Sushovan last December 11 and having the chance to share the importance of the Vatican Library's manuscript digitalization project - a project that has great universal value, i.e. safeguarding the great treasures of humanity at the service of the same humanity. On that occasion I listened with deep gratitude and joy to your promise to apply the maximum flexibility in order to guarantee the start of this project.

I think that it is a good idea to let you know - in an informal way but for the precise purpose of finding a concretely practical way - the guidelines that in a relatively brief time frame, could lead to the constitution of a Foundation specifically dedicated to the Project and to the stipulating of an agreement worthy of the Project itself.

The first point, as I understand it, is finding the capital to provide to the Foundation, necessary to launch the planning and executive activities. In this regard, the involvement of Autonomy is crucial. In fact, the minimum capital needed to be able to start the project the first year appears to be €6,000,000 of which €5,000,000 should be invested by Autonomy and €1,000,000 by the Holy See within the six following months.

The Vatican Library will also devote to the project a year in kind value of €1,250,000, for a total of 10 years and therefore €12,500,000, covering two locations of the Information Technology department (one on Via della Conciliazione 5 and the other at Castelgandolfo), 32 fully equipped rooms, necessary electrical power, security guards and insurance for the manuscripts being moved, the use of the local conservation deposit site on Via della Conciliazione 5 and CED and administration personnel (4+2 people). On the other hand, Autonomy will furnish software, licenses and personnel necessary for the development and maintenance of the web interface and digital database research software, for the estimated in kind value of €7,000,000 in the first triennial.

Autonomy will be bound to guarantee only the start-up of the project and the completion of the first year. All of the payments for the third parties suppliers hardware and software installed by Autonomy within the first three years, will be paid to Autonomy by installments on 36 months. The €6,000,000 conferred to the Foundation will be used by the same to pay for the technology from the first year on, and the remaining capital of €7,500,000, necessary to complete the first triennial will be tied exclusively to the Foundations' ability to raise funds.

For the first five year of the project, Autonomy shall be guaranteed to remain as the main contractor of the project and a member of the Vatican Foundation. Members of the board of the Foundation shall be appointed in equal numbers by Autonomy and the Vatican Library, with the exception of the chair who will be designated by the Holy See. For the same period, Autonomy will be alongside the Vatican Library in every scientific conference and media event as the main sponsor of the Digital preservation project.

Until the end of the fifth year of the project, equipment will be considered property of the Foundation (or joint property of Autonomy and Vatican Library). Only after the fifth year, the equipment will come into the full ownership of the Vatican Library, which, in light of the then existing capital of the Foundation, may autonomously decide whether to continue the process of digitizing or decrease the pace of the work depending on the economic feasibility.

Dear Mr. Lynch, we really want to reach a solution with the flexibility you need, and al-ready dream of the day in which we could attend an audience with the Holy Father, with you and your wife, at which we present the project by then up and running.

Warmest regards,  
 don Cesare Pasini

---

Mons. Cesare Pasini  
 Prefetto

Biblioteca Apostolica Vaticana  
Cortile del Belvedere  
V-00120 Città del Vaticano  
tel. +39 06 698 83301  
[prefetto@vatlib.it](mailto:prefetto@vatlib.it)

To: 'Marco A. Zanchini'[marcoz@autonomy.com];  
Subject: FW: Guidelines  
Sent: Wed 1/19/2011 1:02:00 PM  
From: Sushovan Hussain

---

**From:** Mike Lynch [mailto:mrl@autonomy.com]  
**Sent:** 11 January 2011 22:49  
**To:** pasini@vatlib.it  
**Subject:** re:Guidelines

Dear Mons. Pasini,

Thank you very much for your letter and please accept my apologies, for the delay in my response as I have been trying to find a route forward and awaiting feedback from third parties. Thank you also for your kind hospitality and your gift Angela and I will treasure it always.

As I said at our meeting, I myself and Autonomy also share your belief that the Vatican Library manuscript digitalization project has great universal value. We also agree with the Vatican that the best way for achieving this is through the setting up of a Foundation through which capital can be raised and the project can be run. Whilst my colleague Mr. Broli has tried very hard to gain sponsors this has not been successful to date. We will carry on trying.

In terms of the project financing, if I understand the figures correctly, Autonomy would be investing Euro 5 million and the Vatican would invest Euro 1 million for a one year project. Whilst this sounds interesting to us, I fear I may not be able to convince our board to approve this as they would be concerned the project was under funded and too important to risk under funding such important work. There would also be a complication as they would have to be informed our year 1 costs from third party suppliers is around Euro 6 million.

I have been thinking long and hard about how we could kick this project off. Perhaps an idea would be to go ahead on an even smaller scale project say Euro 2 million. We would invest Euro 1 million and the library would invest Euro 1 million. We could agree on the machines and small scale build out which would provide a showcase with which to make publicity and therefore gather sponsors. If at the end of the period sponsors have not come forward then we could discuss different financing strategies.

I sincerely hope we can reach a solution to the financing issue which would allow this great work to commence and my colleague Mr. Hussain is available to meet with you at any time.

Yours sincerely and my best wishes for the new year,

Mike Lynch

Dr Mike Lynch OBE FREng

CEO Autonomy

[www.autonomy.com](http://www.autonomy.com)

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To: mrl@autonomy.com[mrl@autonomy.com]  
Cc: sushovanh@autonomy.com[sushovanh@autonomy.com];  
corradob@autonomy.com[corradob@autonomy.com]  
From: mons. Cesare Pasini  
Sent: Thur 2/24/2011 3:44:25 AM  
Importance: Normal  
Subject: Letter of Intent

Dear Mr. Lynch,

I remember and thank you for the meeting with you and Dr. Shushovan this past December 11th in the Vatican Library and for your e-mail that you sent this past January 11th with which you affirmed the interest of Autonomy to proceed toward a specific Project for the digitization of the manuscripts of the Library.

I have been waiting for a few weeks for a Letter of Intent (LOI), a draft of which we sent at the beginning of February. During the meeting of February 17th with the lawyer, Julie Dolan, Dr. Chris Goodfellow and Dr. Corrado Brolì, we saw your proposal of the LOI and, after a timely discussion, we agreed on a text together that they had promised to send us on Monday, February 21st. Subsequently, the LOI, a simplified version, was promised for yesterday, Wednesday, February 23rd. Nevertheless, we have not received it yet.

Unfortunately, dear Mr. Lynch, the uncertainty about the Project creates serious difficulties in planning the activities in the Vatican Library, and I find myself no longer able to put off any decisions. I, therefore, kindly ask, if Autonomy is interested in the Project, to send the LOI within this week or, at the latest, by Monday morning, February 28th. After this date, I don't foresee being able to make use of your offer in a successful manner.

Thank you for your attention and excuse me for the chronological specification to which I find myself constrained.

Warmest regards,

Cesare Pasini

—

Mons. Cesare Pasini

Prefetto

Biblioteca Apostolica Vaticana

Cortile del Belvedere

V-00120 Città del Vaticano

tel. +39 06 698 83301

[prefetto@vatlib.it](mailto:prefetto@vatlib.it)

---

**From:** Mike Lynch [mrl@autonomy.com]  
**Sent:** Thursday, February 24, 2011 6:57 AM  
**To:** mons. Cesare Pasini  
**Cc:** sushovanh@autonomy.com; corradob@autonomy.com; andrewk-autonomy.com  
**Subject:** Re: Letter of Intent

Dear Mons. Pasini,

my apologies for the delay. There have had to be some adjustments and some key people are away. However we expect to be able to get back to you in the next few days

Regards,

Mike

At 08:44 24/02/2011, mons. Cesare Pasini wrote:

Dear Mr. Lynch,

I remember and thank you for the meeting with you and Dr. Shushovan this past December 11th in the Vatican Library and for your e-mail that you sent this past January 11th with which you affirmed the interest of Autonomy to proceed toward a specific Project for the digitization of the manuscripts of the Library.

I have been waiting for a few weeks for a Letter of Intent (LOI), a draft of which we sent at the beginning of February. During the meeting of February 17th with the lawyer, Julie Dolan, Dr. Chris Goodfellow and Dr. Corrado Broli, we saw your proposal of the LOI and, after a timely discussion, we agreed on a text together that they had promised to send us on Monday, February 21st. Subsequently, the LOI, a simplified version, was promised for yesterday, Wednesday, February 23rd. Nevertheless, we have not received it yet.

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Thank you for your attention and excuse me for the chronological specification to which I find myself constrained.

Warmest regards,  
Cesare Pasini

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Mons. Cesare Pasini  
Prefetto  
Biblioteca Apostolica Vaticana  
Cortile del Belvedere  
V-00120 Città del Vaticano  
tel. +39 06 698 83301  
[prefetto@vatlib.it](mailto:prefetto@vatlib.it)

Dr Mike Lynch OBE FREng

CEO Autonomy

[www.autonomy.com](http://www.autonomy.com)

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28 February 2011

Monsignor Cesare Pasini  
Vatican Apostolic Library  
Vatican City  
Italy

Dear Monsignor Pasini,

The purpose of this letter is to confirm the parties' intent ("Letter of Intent") with regard to the Biblioteca Apostolica Vaticana's ("BAV") project for the digitalization and archiving of the library's manuscripts ("Project").

The project is intended to be a co-operative venture, with contributions of funding and/or intellectual property and other assets initially from BAV, Sogin, E4 and Metis. Subject to agreement of definitive documents, Autonomy Corporation Plc will contribute €1,000,000 to the foundation being established for the Project (the "Foundation"). Such contribution will be subject to: (1) BAV securing an additional €1,310,000 of cash contributions prior to the commencement of the Project; and (2) other project details to be included in the definitive agreements, such as agreement on the composition of the foundation board, Autonomy's seats on the board, and the percentage of voting rights for each board member.

The definitive agreement shall also include, but not be limited to, the following terms:

1. Autonomy Obligations. Autonomy will deliver the software and the third party hardware for the initial term.
2. BAV Obligations. BAV will provide and pay for the agreed number of employees (operators and tutors), electricity and administrative costs.
3. Initial Term. The initial term of the Project shall be for a period of nine months. The software shall be in production for only six months of the initial term.
4. Publicity. The parties shall actively promote the Project.
5. Payments. The Foundation shall pay Autonomy €1,550,000 for the operation of the initial term of the Project which represents €1,300,000 of costs and €250,000 for the initial license.
6. Actions Upon Expiration of the Initial Term. The parties will meet two weeks prior to the expiration of the initial term to evaluate the future financing of the Project. In the event the Foundation does not have sufficient funds to continue the Project, the licenses granted will terminate. The Foundation shall cease use of the software and return it to Autonomy. BAV shall retain any archived image files produced during the term of the Project.

Page 1

Autonomy Systems Limited, Cambridge Business Park, Cowley Road, Cambridge CB4 0WZ, U.K.  
Phone: +44 (0) 1223 448 000, Fax: +44 (0) 1223 448 001, Email: [autonomy@autonomy.com](mailto:autonomy@autonomy.com)



7. Extension. In the event there are additional funds at the end of the initial term, the Foundation shall pay Autonomy an additional €1,875,000 (rather than €250,000) for the use of the software for use of software during the initial term.

In addition, the term shall be extended for a mutually agreeable period (no less than six months) in accordance with the amount of funding available, up to a period of two years beyond the initial term. The full license fee for an additional two year of operations beyond the initial terms license for a specified amount of data shall be €7,500,000, and shall include a perpetual license.

8. Expiration. If the Foundation does not have operational funding for the Project for beyond the additional two years, the Foundation may nevertheless continue to use the software up to the amount of data licensed under the agreement. Thereafter, no additional data may be processed without payment of additional license fees.

9. The parties agree to negotiate the definitive agreement in good faith on or before 15 March 2011.

Autonomy looks forward to working with the BAV on this important project.

This letter is non-binding and no party to this project will have any obligation with respect to funding or operation of the project or otherwise unless and until we execute definitive agreements.

Sincerely,

A handwritten signature in dark ink, appearing to read "A. Kanter", followed by a horizontal line.

Andrew Kanter  
Company Secretary



4 March 2011

Monsignor Cesare Pasini  
Vatican Apostolic Library  
Vatican City  
Italy

Dear Monsignor Pasini,

The purpose of this letter is to confirm the parties' intent ("Letter of Intent") with regard to the Biblioteca Apostolica Vaticana's ("BAV") project for the digitalization and archiving of the library's manuscripts ("Project").

The project is intended to be a co-operative venture, with contributions of funding and/or intellectual property and other assets initially from BAV, Sogin, E4 and Metis. Subject to agreement of definitive documents, Autonomy Corporation Plc will contribute €1,000,000 to the foundation being established for the Project (the "Foundation"). Such contribution will be subject to: (1) BAV securing an additional €1,310,000 of cash contributions prior to the commencement of the Project; and (2) other project details to be included in the definitive agreements, such as agreement on the composition of the foundation board, Autonomy's seats on the board, and the percentage of voting rights for each board member.

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4. Publicity. The parties shall actively promote the Project.
5. Payments. The Foundation shall pay Autonomy €1,550,000 for the operation of the initial term of the Project which represents €1,300,000 of external costs and a token €250,000 for the six month loan, maintenance & management of Autonomy's software. Autonomy's services for the initial term will be provided free of charge.
6. Actions Upon Expiration of the Initial Term. The parties will meet two weeks prior to the expiration of the initial term to evaluate the future financing of the Project. In the event the Foundation does not have sufficient funds to continue the Project, the licenses granted will terminate. The Foundation shall cease use of the software and return it to Autonomy. BAV shall retain any archived image files produced during the term of the Project.

Page 1

Autonomy Systems Limited, Cambridge Business Park, Cowley Road, Cambridge CB4 0WZ, U.K.  
Phone: +44 (0) 1223 448 000, Fax: +44 (0) 1223 448 001, Email: [autonomy@autonomy.com](mailto:autonomy@autonomy.com)



7. Full License Value

The full value of the Autonomy software required for the two year term is €7,500,000. Should additional funds be available during the two year period Autonomy will be paid 70% of the available funds up to the value of its software. After payment of the full value, the Foundation shall be granted a perpetual license for a specified amount of data.

8. Expiration. If the Foundation does not have operational funding for the Project for beyond the two years, the Foundation may nevertheless continue to use the software up to the amount of data licensed under the agreement. Thereafter, no additional data may be processed without payment of additional license fees.

9. The parties agree to negotiate the definitive agreement in good faith on or before 15 March 2011.

Autonomy looks forward to working with the BAV on this important project.

This letter is non-binding and no party to this project will have any obligation with respect to funding or operation of the project or otherwise unless and until we execute definitive agreements.

Sincerely,

A handwritten signature in dark ink, appearing to read "A. Kanter", followed by a horizontal line.

Andrew Kanter  
Company Secretary

**To:** 'mons. Cesare Pasini'[pasini@vatlib.it]; 'Corrado Broli'[corrado@autonomy.com];  
'julied@autonomy.com'[julied@autonomy.com]  
**Cc:** 'Marcello Mustilli'[m.mustilli@blmius.com]; 'L. Ammenti'[ammenti@vatlib.it]; 'Ambrogio M.  
Piazzoni'[piazzoni@vatlib.it]  
**From:** Chris Goodfellow  
**Sent:** Wed 3/9/2011 6:06:50 AM  
**Importance:** Normal  
**Subject:** RE: Fwd: Revised LOI

Many Thanks Monsoir Pasini for your input, will review and revert in the next couple of days.

Kind Regards

Chris

---

Chris Goodfellow

CTO - Infrastructure Technology

Autonomy Systems Ltd

Cambridge Business Park

Cowley Road

Cambridge

CB4 0WZ

United Kingdom

+44 7796 173167

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---

**From:** mons. Cesare Pasini [mailto:pasini@vatlib.it]  
**Sent:** 05 March 2011 14:07  
**To:** chrisg@autonomy.com; 'Corrado Broli'; julied@autonomy.com  
**Cc:** 'Marcello Mustilli'; 'L. Ammenti'; 'Ambrogio M. Piazzoni'  
**Subject:** R: Fwd: Revised LOI

Dear Sirs,

I agree with all of Luciano's comments, and additionally suggest the following change:

Paragraph. 7. Should be modified to read as follows:

"The full value of the Autonomy software required for the two year term is €7,500,000. Should additional funds be available during the two year period, Autonomy will be paid **a share to be agreed in good faith** of the available funds up to the value of its software. **In the event that funds be not available to pay the entire value of Autonomy software within the two year period, nor the Foundation or BAV shall have any liability to Autonomy.**"

Kind regards,

Mons. Cesare Pasini

Prefetto

Biblioteca Apostolica Vaticana

Città del Vaticano

[prefetto@vatlib.it](mailto:prefetto@vatlib.it)

**Da:** L. Ammenti [mailto:[ammenti@vatlib.it](mailto:ammenti@vatlib.it)]  
**Inviato:** venerdì 4 marzo 2011 16.21  
**A:** Corrado Broli; [julied@autonomy.com](mailto:julied@autonomy.com)  
**Cc:** [chrisg@autonomy.com](mailto:chrisg@autonomy.com); Marcello Mustilli; [pasini@vatlib.it](mailto:pasini@vatlib.it)  
**Oggetto:** Re: Fwd: Revised LOI

The letter will be OK but will be chance somethinghs for the Segretary of the State because many things will be define in second phase.

the point 7 will be :

7. Full License Value

The full value of the Autonomy software required for the two year will be define on the nextone other project details to be included in the definitive agreements.

9. The parties agree to negotiate the definitive agreement in good faith on or before 15 May 2011.

I hope that will be easy accepted from AUTONOMY.

**I wait confirm from my boss mons. Pasini that read in copy.**

Luciano Ammenti

On 04/03/2011 15.48, Corrado Broli wrote:

Luciano,

ti invio la nuova LOI appena ricevuta da Julie. Puoi leggerla e poi la commentiamo in conf call ?

Ciao,

Corrado

Inizio messaggio inoltrato:

**Da:** "Julie Dolan" <[julied@autonomy.com](mailto:julied@autonomy.com)>

**Data:** 04 marzo 2011 15:31:07 GMT+01:00

**A:** "Corrado Broli" <[corrado@autonomy.com](mailto:corrado@autonomy.com)>

**Cc:** "Chris Goodfellow" <[chrisg@autonomy.com](mailto:chrisg@autonomy.com)>

**Oggetto:** Revised LOI

Corrado,

Based on the feedback we received, we have revised the LOI to hopefully relieve their concerns. Can you sent this out ASAP to badget.

Kind Regards

Julie Dolan

Senior Corporate Counsel

Autonomy Systems Limited

Landline +44(0) 2032058701

Mobile +44(0) 7730 781360

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10 March2011

Monsignor Cesare Pasini  
Vatican Apostolic Library  
Vatican City  
Italy

Dear Monsignor Pasini,

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The project is intended to be a co-operative venture, with contributions of funding and/or intellectual property and other assets initially from BAV, Sogin, E4 and Metis. Subject to agreement of definitive documents, Autonomy Corporation Plc will contribute €1,000,000 to the foundation being established for the Project (the "Foundation"). Such contribution will be subject to: (1) BAV securing an additional €1,310,000 of cash contributions prior to the commencement of the Project; and (2) other project details to be included in the definitive agreements, such as agreement on the composition of the foundation board, Autonomy's seats on the board, and the percentage of voting rights for each board member.

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Page 1

Autonomy Systems Limited, Cambridge Business Park, Cowley Road, Cambridge CB4 0WZ, U.K.  
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7. Full License Value

The full value of the Autonomy software required for the two year term is €7,500,000. Should additional funds be available during the two year period Autonomy will be paid a 70% share of the available funds up to the value of its software and in return the Foundation shall be granted a perpetual license for a specified amount of data. In the event that funds are not available to pay the entire value of Autonomy software within the two year period, the Foundation or BAV shall not have any liability to Autonomy.

8. Expiration. If the Foundation does not have operational funding for the Project for beyond the additional two years, the Foundation may nevertheless continue to use the software up to the amount of data licensed under the agreement. Thereafter, no additional data may be processed without payment of additional license fees.

9. The parties agree to negotiate the definitive agreement in good faith on or before 15 May 2011.

Autonomy looks forward to working with the BAV on this important project.

This letter is non-binding and no party to this project will have any obligation with respect to funding or operation of the project or otherwise unless and until we execute definitive agreements.

Sincerely,

A handwritten signature in dark ink, appearing to read "A. Kanter".

Andrew Kanter  
Company Secretary

**From:** L. ammenti [mailto:ammenti@vatlib.it]  
**Sent:** mercoledì 12 gennaio 2011 21.30  
**To:** pasini@vatlib.it; piazzoni@vatlib.it; rfarina@vatlib.it;  
corradob@autonomy.com  
**Subject:** STARTING-project-ingl.doc

Carissimi,

questi sono i nuovi bilanci considerando un arco temporale di due anni, lo startup e la realizzazione di un solo CED.

IL DATA CENTER in v. della Conciliazione 5 sara' realizzato dalla **RITTAL** che prima di venerdi' mi dara' il suo ultimo prezzo compreso del contributo all'iniziativa nella quale includera' i rack per uno Storage da 2,4 PETA BYTE con caratteristiche scalari fino a 43 PETA BYTE.

Inoltre versera' il contributo di € 100.000,00 come promesso.

La societa' **E4** fornira' lo storage di 2,4 PETA BYTE sufficienti per alloggiare la produzione del biennio e la conservazione di circa 8.500 manoscritti.

Il costo di questa operazione sara' di € 290.000,00 a PETABYTE ma domani sapro' il loro impegno nella fondazione o nell'impresa e quanto costera' al progetto questa operazione.

Durante questa fase lavoreranno 15 operatori in totale che si divideranno 5 scanners METIS in 3 turni da 5 ore.

Il loro contratto a progetto prevedera' uno stipendio lordo di € 1.450,00 completo di contributi parasubordinati.

I tutor saranno personale BAV, SCHULER, ANGELINI.

Autonomy versera' nella fondazione € 1.000.000,00 e dara' in comodato gratuito per due anni tutto il software necessario per realizzare il progetto nelle sue fasi, compreso lo sviluppo di ricerca per dati calligrafici e per immagini ed il front end di ricerca WEB per implementare il lancio mediatico del progetto e la ricerca via internet dei dati in formato web.

La Biblioteca Vaticana versera' nella fondazione, a giugno 2011 € 1.000.000,00 e fornira' al progetto le stanze, l'arredo ed i locali sia per il DATA CENTER che per i processi di acquisizione, inoltre tutte le coperture economiche per le polizze assicurative del progetto ed il personale di supporto al DATA CENTER.

Dal secondo anno in poi, analizzando gli eventuali introiti della Fondazione, si concerteranno con le aziende prescelte che hanno collaborato allo startup del progetto, le modalita' di pagamento e di continuazione del progetto.

Vi allego un documento che riassume tutte le informazioni e ne invio una copia anche a Corrado Broli che verifichera' la disponibilita' di AUTONOMY secondo questi nuovi parametri.

Penso che verificheremo la veridicita' di questa possibilita' entro il prossimo venerdi'.

Un caro saluto a tutti e speriamo bene !!!!

--  
\*\*\*\*\*  
Biblioteca Apostolica Vaticana  
Responsabile Coordinamento dei Servizi Informatici  
C.E.D Director Luciano Ammenti  
Tel. 39+0669885004 39+0669879449 39+0669879523  
Fax. 39+0669884795 39+0669885327  
\*\*\*\*\*

CONFIDENTIAL

VATICAN APOSTOLIC LIBRARY, 13-01-2011

**1 PROJECT DESCRIPTION**

- One of the main targets of our institution is to make it easier for our scholars, long course academicians, students about to graduate or occasional visitors, to consult the book heritage.
- In order to achieve this target we have several persons responsible for the consultation rooms, who help, manage and control the work of scholars in the rooms where the access to volumes is allowed by means of open bookcases and other personnel who is responsible for the careful distribution of manuscripts and printed books which are located in our warehouses.
- In these last years the trend in the academic circles is to use technology to improve services and quality of the research thus assuring also future generations the availability of the book heritage which, up to now, we have enormously enjoyed.
- The task of the librarian has greatly developed over the years and he has turned from a simple jealous keeper of heritage into a careful spreader of heritage.
- As the years have gone by, technology has certainly had an important role of support to this activity and each day it is possible to notice technological efforts aimed at getting more satisfactory results.
- Unfortunately however in-depth studies highlight the fragility of the rarest and most valuable heritage and the damage that manuscripts suffer any time a scholar, even a careful one, takes them in his hands.
- It is necessary to bear in mind, to this regard, that the collection of manuscripts of the Vatican Apostolic Library, even if it is not numerically the most important in the world is however the most valuable; a humanist had already defined it as a splendid collection of very valuable jewels (*praeclara supellectiles*).
- Suffice it to remember some famous samples: one of the main ancient samples of the Greek version of the Bible, the so called *Code B*; the two late-ancient manuscripts (that is to say still produced by the Roman world) with the works by Virgilio illustrated with wonderful miniatures (the *Roman Virgilio* and the *Vatican Virgilio*). From the medieval world there are some samples of monastic collections such as the one of Lorsch, from which the renowned *Evangelario* came, present by Charlemagne to the abbey; or, always from the imperial circles, the sample of *De arte venandi cum avibus* by Frederick II directly commissioned by the author-emperor; the different Petrarca's autographs, among which there is the code of the *Canzoniere* and the one of the drafts; some wonderful illustrated samples of the Dantesque *Comedy*: the most famous is certainly the *Dante* commissioned by Federico da Montefeltro. Also some of the masterpieces of the miniature of the Renaissance come from the Urbinate Library, which has been kept for years in the Vatican: for example the great *Bible*, which in the past cost as much as a cathedral.
- Furthermore, the evidence in the Vatican Library ranges over many languages (Latin, Greek, Hebrew, Samaritan, Aramaic, Syrian, Armenian, Coptic, Ethiopian, Georgian, Arabic, Turkish, Illyrian, Slavonic, Egyptian, Indian, Persian, Chinese, Mexican, Italian, English, French, Spanish, German, Provençal) and different fields of knowledge (literature and history, arts and law, astronomy

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and mathematics, natural sciences and medicine, liturgy and patristics, philosophy and theology, medicine, music).

- For such purpose and before it is too late, the Vatican Apostolic Library has decided to undertake a project with the aim of allowing also future generations to consult the manuscripts heritage. The project at issue consists of two different aims: the first is the preservation of the manuscripts heritage complying with high-resolution parameters and acquisition devices already fully tested in similar processes.
- The second is the realization of the whole project according to ISO certification standards, most of all laying the foundation so that the FITS format, used within the project, becomes the ISO standard of preservation of future projects regarding digital archiving, completely free of charge.
- The FITS format, as a matter of fact, was planned in the sixties by NASA with the aim of archiving all space missions and all images deriving from them. Its longevity through the sudden transformations and technical progress has also convinced the astrophysics Faculty as well as the nuclear medicine data banks to use it, because its simple structure allows the data to be reread after many years also in operative environments which were not expected to read them.

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**2 REQUISITES**

ID	Description
REQ-01	The system to realize must allow the digitization of manuscripts of the Vatican Apostolic Library and the maintenance and research of the relative archive.
REQ-02	The manuscripts subject of the digitization and of the consequent archiving are around 80,000.
REQ-03	Each manuscript is composed of about 500 pages.
REQ-04	It is deemed to be of satisfactory quality digitizing each page considering a 8-bit depth x 3 RGB colors considering a 300 ppi depth (pixel per inch) and a resources occupation as regards the RAW image of 100 MB.
REQ-05	For each page it is required to maintain the RAW image as well as the corresponding FITS image.
REQ-06	Each FITS image must have the same quality of the corresponding RAW image; therefore it is considered that each FITS image occupies 100 MB
REQ-07	Each acquired image, before being archived, must be controlled by the Tutor who will confirm its adequate quality level.
REQ-08	The Operator as well as the Tutor must have a professional software at their disposal for images treatment in order to assure an adequate acquisition and control of images.
REQ-09	The (RAW and FITS) images must be archived on a Storage to be installed at the rooms of the Vatican Apostolic Library.
REQ-10	It is required a "Backup" Storage; Backup must be installed in the rooms of the Vatican Apostolic Library.
REQ-11	It is required a site of Disaster Recovery where to store the same information (RAW and FITS images) archived in the Storage.
REQ-12	It is required the maintenance of images (only FITS images) on N Sites, geographically distributed; of each image, stored in the Storage, only a unit (1/N) will be stored on each site; this way it will be possible to obtain a complete image by aggregating all the fragments from N Sites, however none of the sites will contain the complete image.
REQ-13	The system must make it possible to publish on the web low quality draft images of the images of the archived manuscripts.
REQ-14	The system must make it possible to distribute the images of the archived manuscripts to the registered users under different qualities (with the following compression levels: 10%, 30%, 100%).
REQ-15	The system must archive (RAW and FITS) images following an appropriate naming convention bearing the manuscript's CALL NUMBER.
REQ-16	The system must archive (RAW and FITS) images following an appropriate naming convention as regards the directory tree in the file system.
REQ-17	The system must implement proper secrecy policies in order to assure the protection of data stored on N Sites.
REQ-18	The system must implement proper policies of coding of data transferred over the net to the user.
REQ-19	The system must interface with a (Z39.50) system containing descriptive cataloguing data; the outer key to access such data is the CALL NUMBER.

Table 1 – Requisites of the System

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## 2.1 Dimensioning of the reduced capacity system with 15 operators

It is supposed that the manuscript acquisition will be carried out in 3 daily shifts each of 5 hours; for each shift 5 people will be employed. We consider 250 working days in a year.

Under the above mentioned assumptions the following dimensioning with regard to Storage, Backup and Disaster Recovery has resulted.

1 <sup>st</sup> TRIENNium, 1 <sup>st</sup> year	
Average time of acquisition 1 page	4 min
Available daily time for the acquisition	5 h * 2 shifts * 30 persons = 225 h = 13500 min
Nr. Pages acquired every day	13.500 min / 4 min = 3.375 pg
Nr. Pages acquired 1 <sup>st</sup> year	3.375 pg * 250 days = 843.750 pg
Size of images regarding 1 page	100 MB (img RAW) + 100 MB (img FITS) = 200 MB
Storage Size 1 <sup>st</sup> year	843.750 pg * 200 MB = 169 TB
Backup Size 1 <sup>st</sup> year	843.750 pg * 200 MB = 169 TB
Disaster Recovery Size 1 <sup>st</sup> year	NOT IMPLEMENTED
Backup DISASTER Size 1 <sup>st</sup> year	
Server Autonomy 10-30-100 150%	843.750 pg * 200 MB = 169 TB
Backup Autonomy	843.750 pg * 200 MB = 169 TB
Total STORAGE 1 <sup>st</sup> YEAR	0,675 Peta Byte

For the following years it is estimated that the manuscript acquisition will be carried out in 3 daily shifts each of 5 hours; for each shift 15 people will be employed. We consider 250 working days in a year.

Under the above mentioned assumptions the following dimensioning with regard to Storage, Backup .

1 <sup>st</sup> TRIENNium, 2 <sup>nd</sup> and 3 <sup>rd</sup> year	
Average time of acquisition 1 page	2 min
Available daily time for the acquisition	5h * 3 shifts* 15 persons = 225 h = 13.500 min
Nr. Pages acquired every day	13.500 min / 2 min = 6750 pg
Nr. Pages acquired every year	6750 pg * 250 days = 1.687.000 pg
Size of images regarding 1 page	100 MB (img RAW) + 100 MB (img FITS) = 200 MB
Yearly Storage size	1.687.000 pg * 200 MB = 338TB
Yearly Backup size	1.687.000 pg * 200 MB = 338TB
Yearly Disaster Recovery Size	
Yearly Backup DISASTER Size	
Yearly Server Autonomy 10-30-100 150%	1.687.000 pg * 200 MB = 338TB
Yearly Backup Server Autonomy 10-30-100 150%	1.687.000 pg * 200 MB = 338TB
Total STORAGE 2 <sup>st</sup> year	1.687.000 pg * 200 MB * 4 = 1,36 PB
TOTAL STORAGE END 1 <sup>st</sup> TRIENNium	4.217.750 pg * 200 MB = 843.550 * 4 = 3,374 PB
DIGITALIZED MANUSCRIPTS IN 1 <sup>st</sup> TRIENNium	8434
COST X PETA BYTE	3,374,00 PB * 290,000.00 = € 978.476,00

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**3 SUMMARY OF COSTS****Summary of costs 1st phase – first biennium**

15 acquisition operators 24 months € 1.450,00 tax-incl.		€ 522.000,00
2 control tutors		----- BAV -----
5 Scanner Metis		€ 240.000,00
		AUTONOMY
1 complete CED as per the attached project		RITTAL € 300.000,00 ?
4 protection firewall		AUTONOMY
Switched off fiber between two INTEROOT CED		-----
ISO Standard FITS format	-----	-----
2 PRO pc tutor		-----
Hardware and Software x 1 CED 2,4 PB		€ 696.00,00 E4
Inf/band network 40 giga and lan/wan apparatuses		E4
ALL SOFT. AUTONOMY and Sustainable Development		-----
Electricity consumption 2x300 KW		-----
Administrative costs 2 people, Insurance manuscript, ecc. BAV		-----

BAV Sustainable Development mss search 2 scriptores	-----

**1st phase – first biennium**

TOTAL COSTS two years	€ 1.858.000,00
FOUNDATION AUTONOMY 01-02-2011	€ 1.000.000,00
FOUNDATION BAV 01-06-2011	€ 1.000.000,00
FOUNDATION RITTAL 01-02-2011	€ 100.000,00
CAPITAL FOUNDATION	€ 2.100.000,00



From: Ambrogio M. Piazzoni [mailto:piazzoni@vatlib.it]  
Sent: giovedì 10 marzo 2011 18.17  
To: Corrado Broli  
Cc: pasini@vatlib.it; ammenti@vatlib.it; m.mustilli@bmilius.com  
Subject: Re: Lettera d'intenti  
Importance: High

Caro Ingegnere Broli,

Monsignor Pasini sarà di nuovo in sede il 19 marzo. Nel frattempo esamineremo la Lettera di intenti e, appena torna il Prefetto, Le faremo sapere.

Intanto molte grazie per l'attenzione che sempre dedica alla Biblioteca.

Con un cordiale saluto

Ambrogio Piazzoni

At 17:59 10/03/2011 +0100, you wrote:

Carissimo Monsignor Pasini,

le invio in allegato la lettera d'intenti che abbiamo preparato tenendo conto dei commenti Suoi e di Luciano Ammenti.

---

Nel restare in attesa di un riscontro alla presente, Le porgo i più cordiali saluti,

Corrado Broli

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\_\_\_\_\_ Informazioni da ESET NOD32 Antivirus, versione del database delle firme digitali 5942 (20110310) \_\_\_\_\_

Il messaggio è stato controllato da ESET NOD32 Antivirus.

[www.nod32.it](http://www.nod32.it)

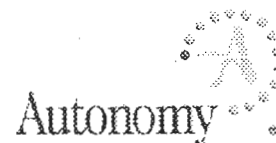
—  
Il messaggio e' stato analizzato alla ricerca di virus o contenuti pericolosi da Mailscanner, ed e' risultato non infetto.

Dott. Ambrogio M. Piazzoni  
Vice Prefetto  
Biblioteca Apostolica Vaticana  
V-00120 Città' del Vaticano

tel: +39 06.698.79481 +39 06.698.79441  
fax: +39 06.698.85804  
net: piazzoni@vatlib.it  
web: www.vaticanlibrary.va <<http://www.vaticanlibrary.va/>>

Prima di stampare questo messaggio, pensate all'ambiente  
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Avant d'imprimer, pensez à l'environnement  
Bevor Sie diese E-Mail ausdrucken, denken Sie an die Umwelt  
Antes de imprimir este mensaje, piense al medio ambiente

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23 March2011

Monsignor Cesare Pasini  
Vatican Apostolic Library  
Vatican City  
Italy

Dear Monsignor Pasini,

We are pleased to inform you that Autonomy would like to participate in the Biblioteca Apostolica Vaticana's ("BAV") project for the digitalization and archiving of the library's manuscripts ("Project") subject to definitive agreement which shall set forth the parties' rights and obligations. Such agreement will also reflect, if all terms are agreed, Autonomy Corporation's contribution of €1,000,000.

Autonomy looks forward to working with the BAV on this important project.

Sincerely,



Andrew Kanter  
Company Secretary

Page 1

Autonomy Systems Limited, Cambridge Business Park, Cowley Road, Cambridge CB4 0WZ, U.K.  
Phone: +44 (0) 1223 448 000, Fax: +44 (0) 1223 448 001, Email: [autonomy@autonomy.com](mailto:autonomy@autonomy.com)

To: sushovanh@autonomy.com[sushovanh@autonomy.com]  
Cc: 'Corrado Broli'[corrado@autonomy.com]; mrl@autonomy.com[mrl@autonomy.com]  
From: mons. Cesare Pasini  
Sent: Mon 5/30/2011 4:13:08 AM  
Importance: Normal  
Subject: See attach.  
1246 Sushovan.pdf

See attach.

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Mons. Cesare Pasini

Prefetto

Biblioteca Apostolica Vaticana

Cortile del Belvedere

V-00120 Città del Vaticano

tel. +39 06 698 83301

[prefetto@vatlib.it](mailto:prefetto@vatlib.it)



*Il Prefetto*

Vatican City State, 30 May 2011

Prot. 2011/1246/P-AI06

Dear Mr Sushovan,

I acknowledge receipt of Your letter dated May 18, 2011 with regard to the Biblioteca Apostolica Vaticana ("BAV") project to digitalize its manuscripts collection (the "Project"). I wish to thank you for your kind words and Your confirmation of Autonomy continued interest and support to the Project.

As per the recent communications between Mr. Luciano Ammenti and Autonomy representatives, we wish to detail and finalize the lines of BAV and Autonomy cooperation within a meeting to be held at the BAV in the next few weeks. The points we wish to propose as agenda, in that regard, are as following:

- BAV acts as the main contractor, managing all relationships with suppliers and partners
- Autonomy contributes to the Project with 1M, to be paid in two instalments
- No payment to Autonomy for the first 24 months of the Project
- After 24 months, BAV pays Autonomy 50% of all funds cashed by BAV within such a 10-year period until Autonomy has received 2,5M
- Autonomy is credited as main sponsor of the Project. BAV is ready to recognize such a credit in perpetuity in exchange for a perpetual license from Autonomy (after the payment of 2,5M).

If for any reason the above points need in Your view to be changed substantially, please let us know in advance. Otherwise, I propose that we fix a date to meet as soon as possible in Rome, to discuss them in more detail with the goal to sign a new deal memo based on them.

Msgr. Cesare Pasini  
Prefect

Mr. Hussain Sushovan  
Autonomy Director  
sushovanh@autonomy.com

Biblioteca Apostolica Vaticana - Cortile Belvedere - V-00120 Città del Vaticano  
Tel. +39/06 69883301 - 06 69879400 - Fax +39/06 69885327 - 06 69884795

??

X-MDAV-Processed: autonomy.com, Thu, 06 Oct 2011 14:14:02 +0100

X-Spam-Processed: autonomy.com, Thu, 06 Oct 2011 14:14:01 +0100

(not processed: spam filter heuristic analysis disabled)

X-Rcpt-To: mrl@autonomy.com

X-MDRcpt-To: mrl@autonomy.com

X-Return-Path: cesare.pasini@gmail.com

X-Envelope-From: cesare.pasini@gmail.com

X-MDaemon-Deliver-To: mrl@autonomy.com

DKIM-Signature: v=1; a=rsa-sha256; c=relaxed/relaxed;

d=gmail.com; s=gamma;

h=return-receipt-to:from:to:subject:date:message-id:mime-version

:content-type:content-transfer-encoding:x-mailer:thread-index

:content-language:disposition-notification-to;

bh=xZJVUQ71CXAeunYtwyFas1d9y1Y32svUFFuJfFvFP7U=;

b=r9BRZu3rEzbhs4ssbRuQHjvVdQkl0gbDSuIYTZmrlMA+taVQ2CzFoWv0TNvqDpu  
2y1

HyiSYOyMPG/m/ICghzLTM1vdrWBlgSYu9FpQtihgo3QIBPmAnNe2riqVhnJWs8jmi  
WFq

JUHXPovc0mmoKTOj8Aacw08TBeBphMN+q7Rzg=

From: "don Cesare Pasini" <cesare.pasini@gmail.com>

To: <mrl@autonomy.com>,

<angelab@autonomy.com>

Subject: digital project in Vatican Library

Date: Thu, 6 Oct 2011 15:13:56 +0200

X-Mailer: Microsoft Office Outlook 12.0

Thread-Index: AcyD+2rgRz8X0MbvQMWyCivtap+TZgALTyuQ

X-Virus-Scanned: by bsmtpd at autonomy.com

Dear Mike and Angela,

I would like to thank you for the positive meeting with Mr Sushovan and also for having finally found an economic and operational agreement. We are waiting for the draft of the contract in order to launch the project of digital maintenance,  
don Cesare

Mons. Cesare Pasini  
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Dr Mike Lynch OBE FREng

CEO Autonomy

[www.autonomy.com](http://www.autonomy.com)

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Dr Mike Lynch OBE FREng

CEO Autonomy

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